TECHNOLOGY DEPARTMENT

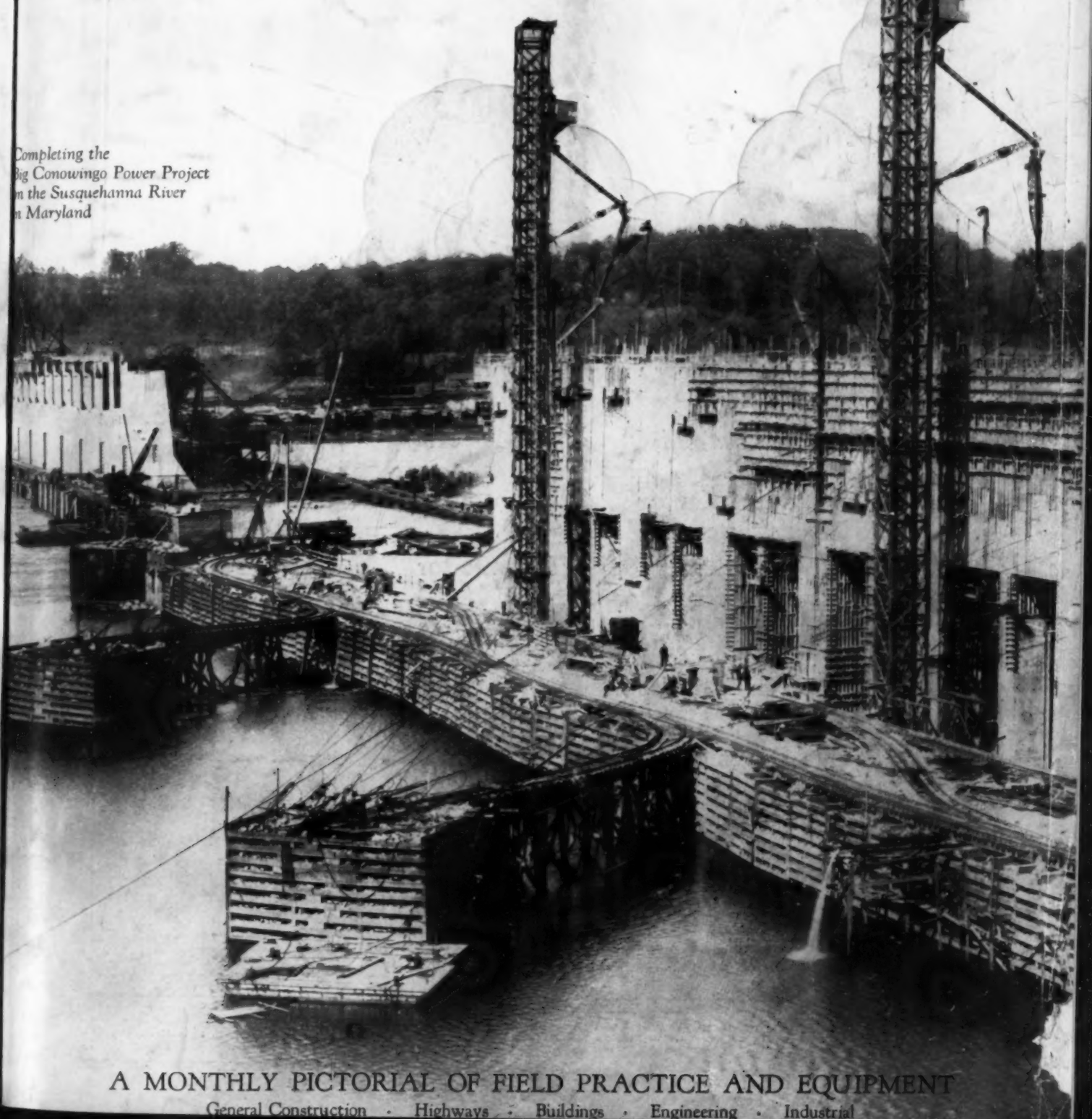
• First Copy

September 1928

Construction Methods

PUBLIC LIBRARY
AUG 19
DET

McGraw-Hill Publishing Company, Inc., New York, N. Y.

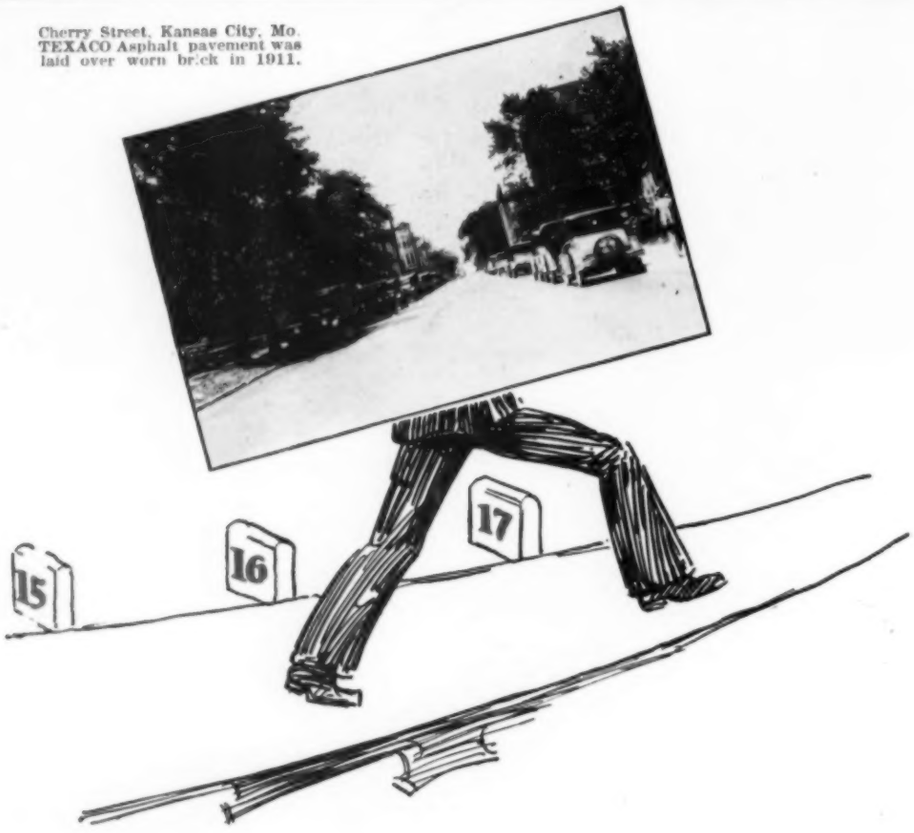


Completing the Big Conowingo Power Project in the Susquehanna River in Maryland

A MONTHLY PICTORIAL OF FIELD PRACTICE AND EQUIPMENT

General Construction · Highways · Buildings · Engineering · Industrial

Cherry Street, Kansas City, Mo. TEXACO Asphalt pavement was laid over worn brick in 1911.



15th year—16th year—17th ....

Smooth, waterproof, durable, this 17-year-old TEXACO Asphalt pavement on Cherry Street, Kansas City, Mo., is a credit to the contractor who laid it.

Out for new business today, this contractor can point confidently to the TEXACO street laid in 1911, as an example of the kind of work he does. And it is bound to count strongly in his favor.

In 1400 U. S. cities and towns, TEXACO Asphalt pavements are safeguarding the reputations of the contractors who laid them.

TEXACO
ASPHALT

New York
Philadelphia
Richmond
Boston
Jacksonville

The Texas Company
ASPHALT SALES DEPT.
17 Battery Place, New York City

Chicago
Cleveland
Kansas City
Houston
Dallas

Construction Methods, September, 1928, Vol. 10, No. 9. Published Monthly. McGraw-Hill Publishing Company, Inc., Tenth Ave. at Thirty-sixth St., New York, N. Y. Two years for $1; per copy, 5 cents. Entered as second-class matter, October, 1926 issue, Vol. 8, No. 10, at the Post Office at New York, N. Y., under the Act of March 3, 1879. Printed in U. S. A.

TECHNOLOGY DEPT.

What's Doing This Month

Looking it over with the Editor

"How" and "What With"?

IN THESE days of utilizing to the fullest extent mechanical methods as a substitute for hand labor on construction, the answers to these two questions loom large in planning any job: "How" and "What With"? The first concerns the methods to be followed and the second, of equal importance, relates to the vital matter of selecting the proper equipment for the particular job in hand.

The pictorial article on difficult bridge pier construction in deep water at Tampa Bay (pp. 6-10) gives unusually complete answers to both of these queries. As superintendent on the work for the Northwest Florida Corporation, P. R. Johnson, the author, is peculiarly well qualified to tell just how the job was handled. He does so in clear and concise fashion. A feature of the story is the completeness of detail with which Mr. Johnson covers the subject of plant used. He specifies sizes and types for all of the mechanical equipment. The man who may be called upon to handle a similar project appreciates data of this kind at its full value.

FRESH IDEAS—"The only way to beat the game in business today," says Floyd Parsons in Advertising & Selling, "is for managements to produce an unending variety of fresh ideas." That applies to the construction industry as well as to business in general. There may be a fresh idea for you in this issue of Construction Methods. Look it over.

ROAD DIVIDENDS — We recall this statement from L. D. Blauvelt's presidential address before the American Association of State Highway Officials last year: "When one is asked the question: 'When will this enormous expenditure for road improvement stop?', the reply can be made: 'When the taxpaying public fails to realize the enormous dividends returned from their investment.'"

On this basis it is our guess that this nation's road-builders will not be faced with any race-suicide problem for some years to come.

CONSTRUCTION METHODS

A monthly review of modern construction practice and equipment

PUBLISHED BY
McGRAW-HILL PUBLISHING COMPANY, INC.
TENTH AVENUE AT 36TH ST., NEW YORK

A Dozen Ways

Turn to pages 10-12 of this issue and you will find something different in the way of a pictorial feature. Here *Construction Methods* departs from the customary article describing a single job. Instead, a basic operation common to almost *all* construction projects has been selected and pictures are presented showing a variety of methods and equipment for "Getting Concrete from the Mixer to the Forms." This group of typical views, of course, tells only one chapter of the story. There are dozens of *other* ways of doing the same thing.

On your own work you undoubtedly have employed some different method or plant set-up that proved effective for delivering concrete. Haven't you a picture that tells the story? If so, mail it to the Editor of *Construction Methods*, with a brief descriptive caption. Payment at regular rates, of course, for all pictures found acceptable for publication. Let us see how many ingenious methods and combinations of equipment you construction men have devised for getting concrete from the mixer to the forms.

When Changed Plans Cut Costs

Natural disasters do not always cut into job profits. When an unprecedented flood tore up the level plain on which a bridge contractor had planned to roll a tower for pouring concrete in shore piers and bents, he was forced to adopt some other method of performing the work. A derrick on a three-legged frame was so designed that the whole outfit could be moved over the rough ground. The derrick erected and dismantled forms, placed reinforcing steel, and lifted concrete into place. These operations were performed at a cost considerably lower than the original estimate, and more money was made than possibly could have been by following the first plans. Necessity, again, was mother of invention—at a profit.

Before Construction Starts

Engineers and contractors often have the idea that the major problems of a large project are construction problems. That is not always the case. Other factors complicate the situation, many of them occurring before the work reaches the stage of working drawings.

A case in point is that of the big Conowingo power development in Maryland, on which the construction operations of Stone & Webster, Inc., and the Arundel Corporation are pictured on pp. 24-28. In discussing the project in a recent paper before the American Institute of Electrical Engineers C. W. Kellogg, president of the Engineers Public Service Company, said, in part:

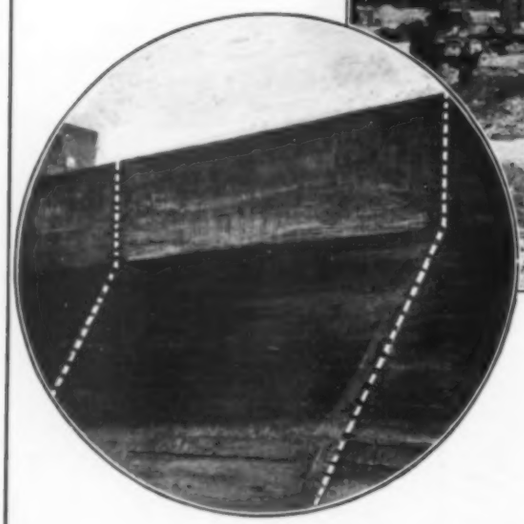
"It has been a definite project for 44 years before its final realization. Years of stream flow measurements, acquisition of land and rights, study of size and location of markets and legal investigation had been made before the project could be put through to a successful end." For the men who handle construction in the field this comment provides an interesting background for the project as a whole.

A HINT ON BUYING, from a City Engineer: "Pick a standard article, get the ideas of your foreman, then take a trip with him to see the machine in action, if you are not already acquainted with it. Talk with the operator when he is alone and with the mechanic who repairs the machine. Do your buying accordingly."

COMING: Hard rock excavation for the west approach and anchorages of the new $75,000,000 Hudson River bridge between New York and New Jersey, a Foley Brothers, Inc., job.

"Building Islands to Order" at Tampa, Fla., a picture story replete with details on the pile-driving, dredging and bulkhead construction involved in creating Davis Islands.

Another "Step-by-Step" presentation, this time on casting and setting concrete poles for the street lighting system of a big city.



Saving $100 Per Day

After completing a new hydro-electric plant at Kaukauna, Wis., the Green Bay and Mississippi Canal Co. had to build a flume to divert the water to the new turbines. During part of this period the company was forced to buy outside electric current for $100 per day more than it cost them to produce it.

High-Early-Strength Universal Concrete was specified to fill a gap in the wall left for trucks to pass thru while the barrier to the new flume was being cut away. As a result, water was admitted to the new flume 3½ days after the last concrete was placed—about 24 days earlier than would have been possible had ordinary concrete been used.

This substantial saving is another example of what *High-Early-Strength* Universal Concrete means when time is money.

Such concrete is made with the usual materials, usual labor, usual equipment and usual Universal cement—all applied according to fully tested methods. The coupon will bring you complete details promptly.

Universal Portland Cement Co.

Chicago Pittsburgh Minneapolis Duluth Cleveland Columbus New York

Concrete for Permanence

UNIVERSAL PORTLAND CEMENT CO.,
208 South La Salle Street, Chicago.

Without obligation, send me detailed information on methods for securing strong concrete in 3 days with the usual materials, usual equipment, usual labor and usual Universal cement.

Name .....

Address .....

C.M. 9-28

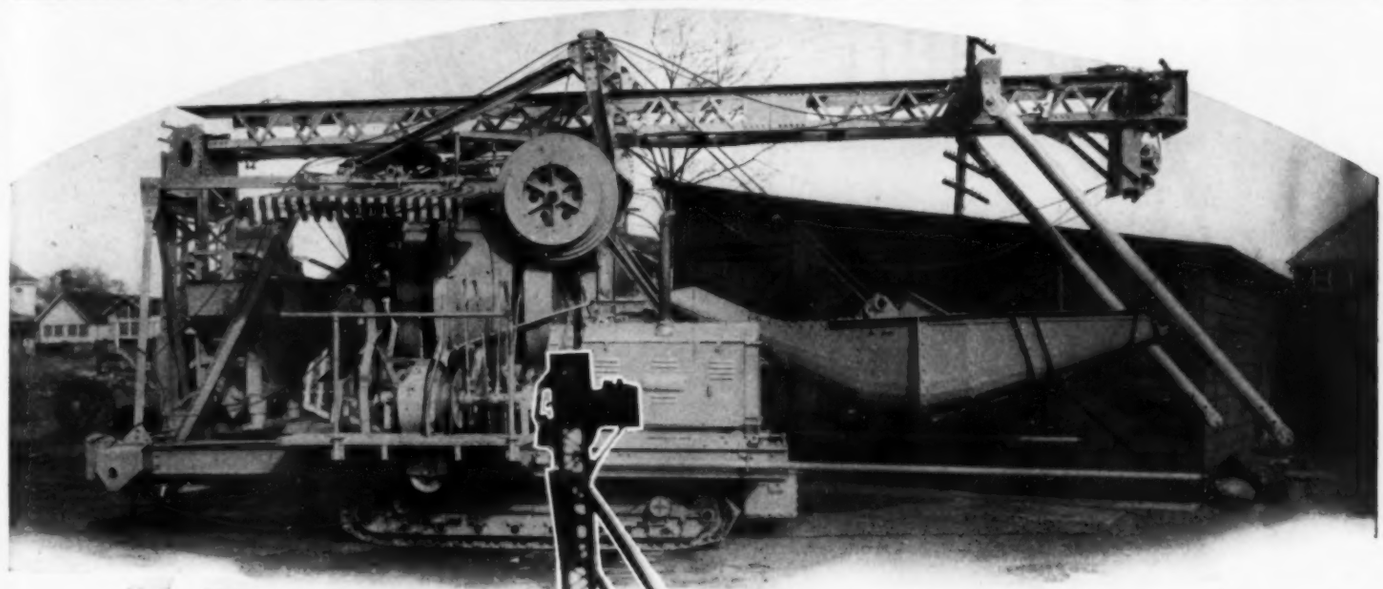
Construction Methods

McGraw-Hill
Publishing Company, Inc.
JAMES H. MCGRAW, *President*
EDWARD J. MEHREN, *Vice-President*

A monthly pictorial of field practice and equipment illustrating successful construction, maintenance and material-handling methods for general construction, highways, buildings, industrial plants and public works and utilities

WILLARD CHEVALIER
General Manager
ROBERT K. TOMLIN
Editor

VOLUME 10 | NEW YORK, SEPTEMBER, 1928 | NUMBER 9

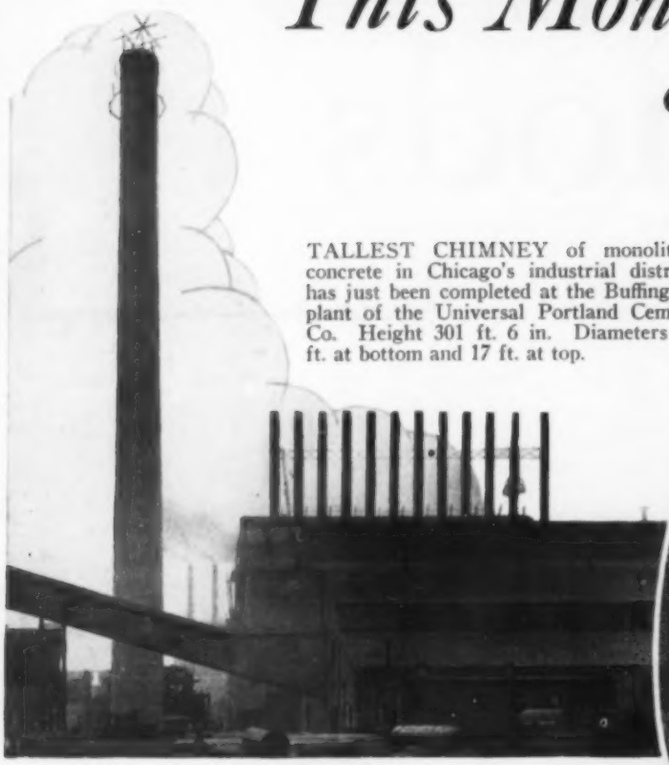


MAST *on* *Paving Mixer*

FOR pouring concrete in building foundations, retaining walls and other structures, George M. Brewster & Son, Inc., contractors of Bogota, N. J., are making effective use of a novel combination plant consisting of a standard crawler-mounted paving mixer carrying at its discharge end a concrete hoisting and chuting mast, or "monkey-on-a-stick" rig, both pieces of equipment being supplied by the Ransome Concrete Machinery Co., of Dunellen, N. J.

After using this rig to pour building foundations at Fort Lee, N. J., Thomas J. Catlaw, superintendent of the Brewster organization, moved it to Hohokus to construct retaining walls. The mast rig may be dismantled and replaced by the standard boom and bucket with which the paver is regularly equipped, according to Clemens B. Hoppe, mechanical engineer for the contractor.

This Month's
"News Reel"



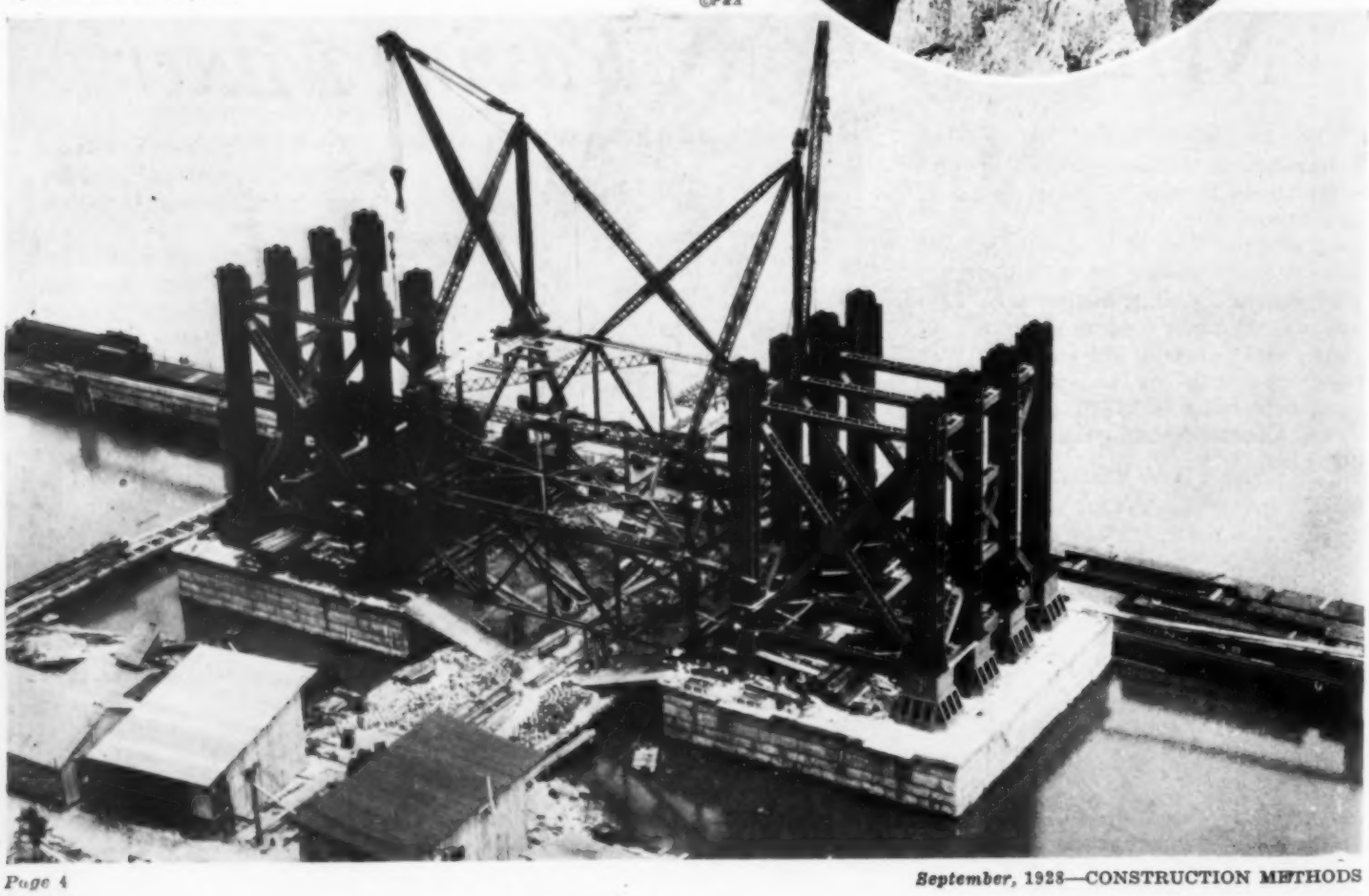
TALLEST CHIMNEY of monolithic concrete in Chicago's industrial district, has just been completed at the Buffington plant of the Universal Portland Cement Co. Height 301 ft. 6 in. Diameters 26 ft. at bottom and 17 ft. at top.

© Wide World

SPANNING COLORADO RIVER *(right)* at Lees Ferry, Ariz., where bridge 608 ft. long across Marble Canyon will connect highway systems of Arizona and Utah.

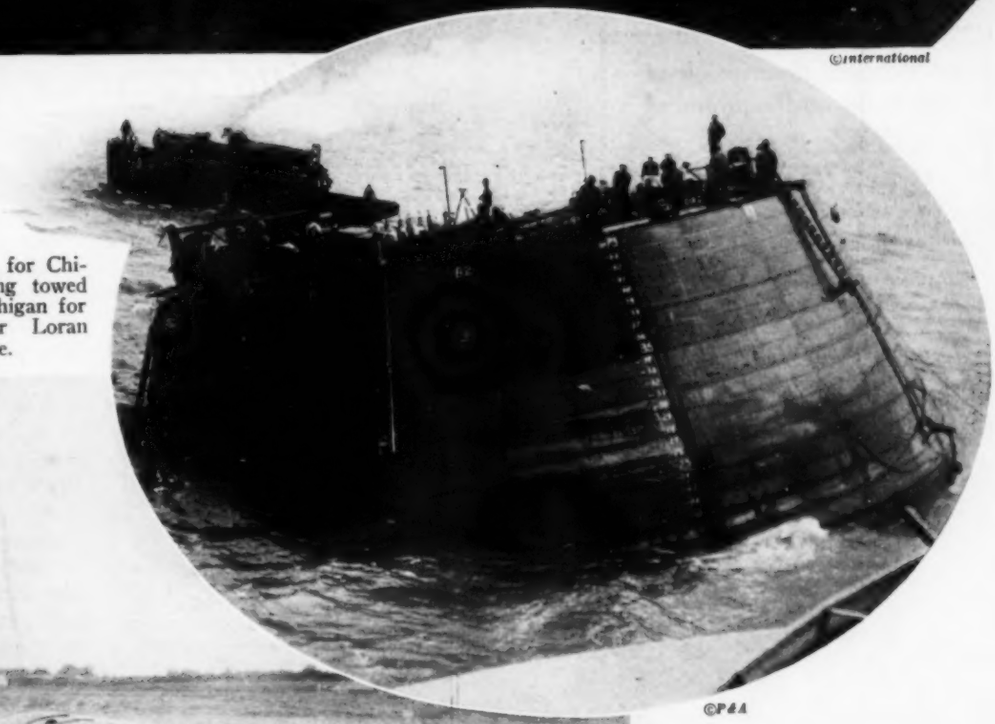
TOWER ERECTION STARTS *(below)* on the New Jersey end of the $75,000,000 Hudson River bridge with 3,500-ft. suspension span between Fort Washington, N. Y., and Fort Lee, N. J. McClintic-Marshall Co. is putting up the steel on west pier built by Silas Mason Co., Inc.

©P&A



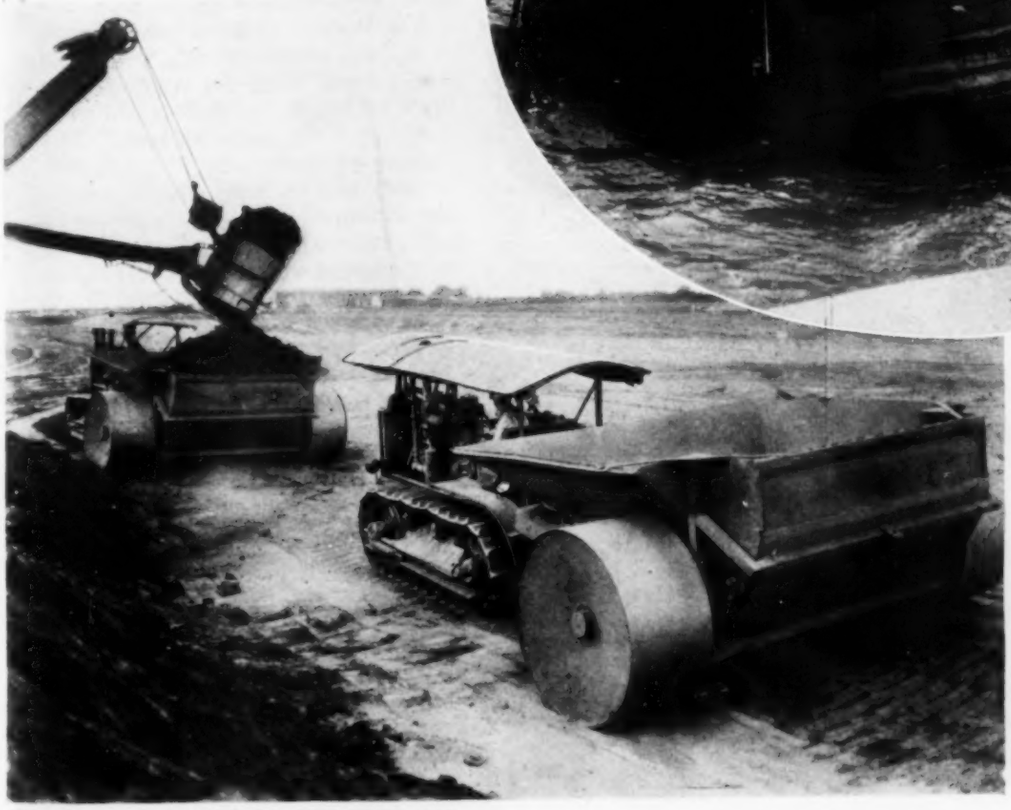
©International

LONDON'S NEW AIRPORT. Birdseye view of the hangars, shops, administration buildings and runway system at Croydon.



©P&A

CRIB INTAKE *(right)* for Chicago's water supply being towed out to place in Lake Michigan for sinking. City Engineer Loran DeL. Gayton is in charge.



NEW FREIGHT YARDS *(left)* for the Southern Pacific Railway at Fresno, Calif. Caterpillar tractors haul special 12-yd. LaTourneau carts on big earth-moving and grading job, 2 miles long and 700 ft. wide. Cuts of 8 ft. and fills of 5 ft. are involved. Ultimate cost of project, $5,000,000.

Piers in Deep Water

PLACING STEEL REINFORCEMENT inside twin shells for one of the piers of the West Bay bridge.

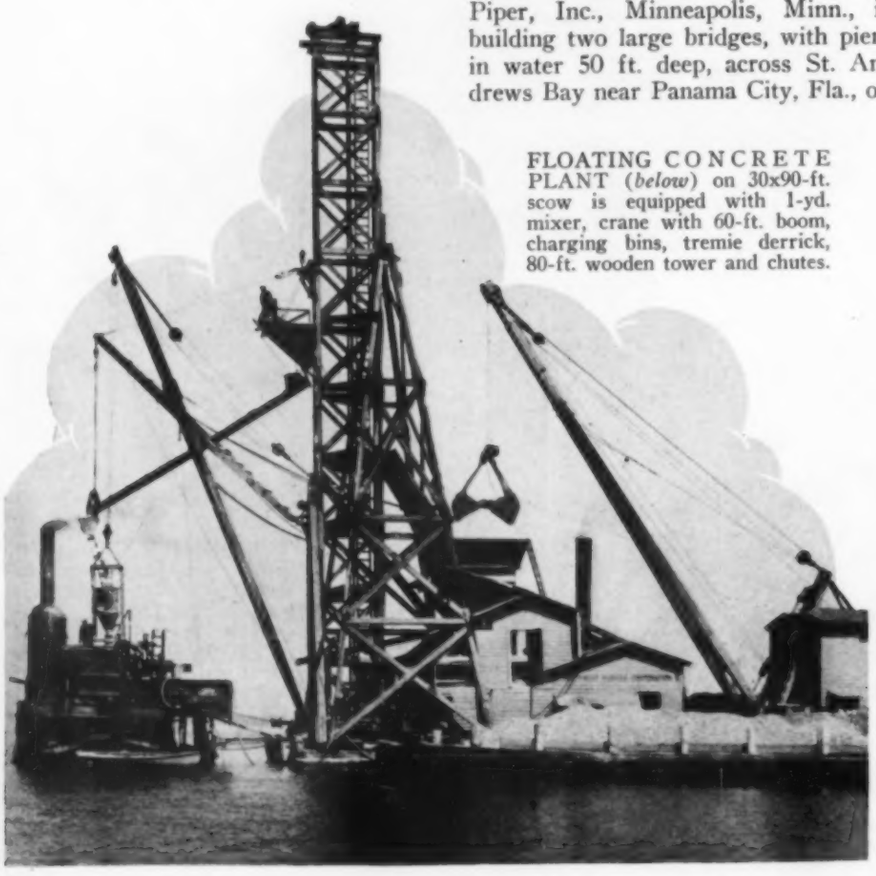
Underwater Hammers and Foundation

A detailed description of methods and equipment

BY P. R. JOHNSON,

Manager, Northwest Florida Corporation, Panama City, Fla.

THE Northwest Florida Corporation, organized by Siems, Helmers & Schaffner, Inc., St. Paul, Minn., and Johnson, Drake & Piper, Inc., Minneapolis, Minn., is building two large bridges, with piers in water 50 ft. deep, across St. Andrews Bay near Panama City, Fla., on the new Gulf Coastal Highway route.



FLOATING CONCRETE PLANT (*below*) on 30x90-ft. scow is equipped with 1-yd. mixer, crane with 60-ft. boom, charging bins, tremie derrick, 80-ft. wooden tower and chutes.

Scope of Work—The East Bay, or DuPont, bridge, is 6 miles southeast of Panama City and crosses East St. Andrews Bay; its total length is 4,000 ft., of which 1,310 ft. is hydraulic fill and 2,690 ft. is bridge proper.

The West Bay, or Hathaway, bridge, is 5 miles northwest of Panama City and crosses West St. Andrews Bay; its total length is 7,525 ft., of which 3,800 ft. is hydraulic fill and 3,725 ft. is bridge proper.

Both bridges have steel superstructures, concrete floors, steel-encased concrete foundations on piles, and swing spans with wooden decks.

Steel Tubes for Piers

East Bay bridge has 11 piers in about 50 ft. of water and West Bay bridge has 19 piers in about 40 ft. of water. Each pier, except the pivot piers, is built by sinking two steel shells (two tubes making one pier) of 16- or 14-ft. diameter and spaced 22 ft. apart center to center. These shells or tubes, assembled and riveted together on falsework, are lowered to place by heavy American winches and steel blocks using $\frac{7}{8}$-in. plow steel Roebling wire rope on a specially constructed wooden A-frame resting on pile and timber falsework erected at each pier site.

Riveting on the steel shells is done

for Highway Bridges

NOTE EXTENT AND CHARACTER of floating equipment, including derrick, scows and concrete plant with 80-ft. wooden tower on barge at right.

Steel Shells Overcome Difficulties

with Boyer riveting hammers and all the reaming is done with reversible Ingersoll-Rand air drills. All air is furnished by Sullivan 110-cu.ft. portable gasoline-driven air compressors.

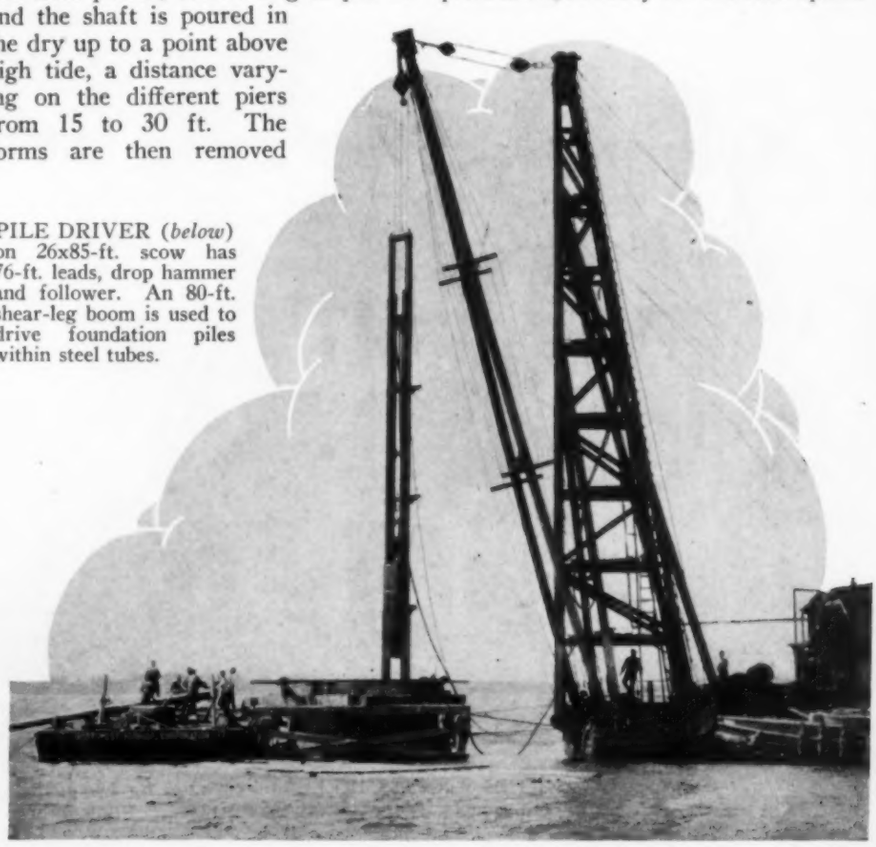
When the tubes are landed in position they are excavated inside with a 1½-yd. Owen clamshell bucket and lowered to the proper depth.

Foundation piling, in lengths of 50 to 80 ft. and numbering 37 for the 16-ft. tubes and 26 for the 14-ft. tubes, are then driven under water with a McKiernan-Terry steam hammer equipped with a pipe extension. As the driving is done at a great depth special cast-iron weights are attached to the tips of the piles and removed when the piling is landed in proper position for driving. The pile driver is equipped with 80-ft. leads for driving falsework piling, but when driving foundation piling a shear-leg is added from which is hung a set of swinging leads which can be lowered in the tube.

A gravel cushion is then placed through the water in the tube and a concrete seal, of depth varying from 15 to 28 ft., is deposited through the water with a 10-in. tremie 80 ft. long. After this concrete sets the tube is pumped out with Pulsometer and Nye pumps and the piling are cut off 5 ft. above the top of the seal concrete. The pier shaft bottom reinforcing is then suspended in the tube and the next lift of 8 ft. of concrete is poured in the dry with the tremie up to the top of the permanent shell.

The pier shaft forms, made of steel, are then placed, reinforcing is put in and the shaft is poured in the dry up to a point above high tide, a distance varying on the different piers from 15 to 30 ft. The forms are then removed and the concrete given ten coats of waterproofing, after which the temporary shells are removed for future use on other piers.

Wooden forms, with Universal form clamps and ¾-in. rods, are then placed for the pier tops, wing walls and caps. Pier tops, wing walls and caps are poured, forms removed and form rods pulled. Falsework is then removed for use at other piers. The piers are then ready for the steel spans.



PILE DRIVER (*below*) on 26x85-ft. scow has 76-ft. leads, drop hammer and follower. An 80-ft. shear-leg boom is used to drive foundation piles within steel tubes.

The same operation is followed in the building of the pivot piers except that these tubes are 30 ft. in diameter and the pier shafts are 22 ft. in diameter.

Approach Spans

Approach spans, of 45 ft. each, are built with bents of 18-in. concrete piling from 35 to 80 ft. long, waterproofed with 10 coats of waterproofing. On concrete caps are placed 26-in. I-beams with concrete deck and railing.

Bulkheads at each approach are built of creosoted round piling 47 to 38 ft. long; the sheeting is 2x10-in., creosoted, 24 to 36 ft. long, bolted with ¾-in. ingot iron bolts.

End and center fenders are built of creosoted round piling 85 to 95 ft. long with 8x8-in. waling and 3x10-in. braces properly bolted with ¾-in. ingot iron bolts.

Fresh water from 2-in. well points is piped to each pier by a 2- and 1½-in. pipe line laid on the bottom of the bay. Pumping is done by a 6x4x6-in. Worthington duplex steam unit.

Derrick Scows

All the derrick work at each bridge is performed by four 30x100-ft. scows upon which are mounted steel Wiley whirleys with 75-ft. steel booms operated by 9x10-in. three-drum American engines and 7x9-in. American swinging engines, steam being furnished by 60-hp. Scotch marine boiler.

Each derrick scow is equipped with electric lights furnished by a 1-kw. Moon turbine generator, a 10x6x10-in. Worthington jet pump with 2½-in. jet.

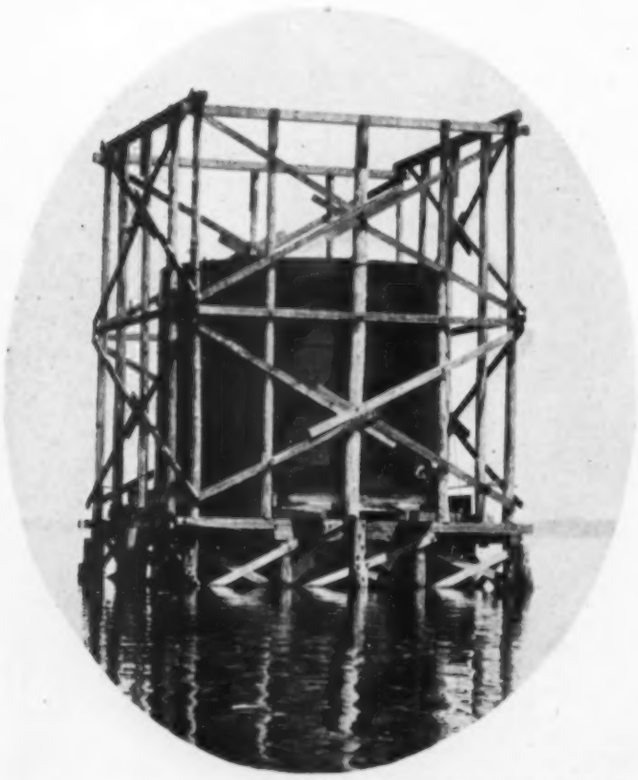
P. R. JOHNSON, manager, under the direction of N. F. Helmers, vice-president, of the Northwest Florida Corporation.

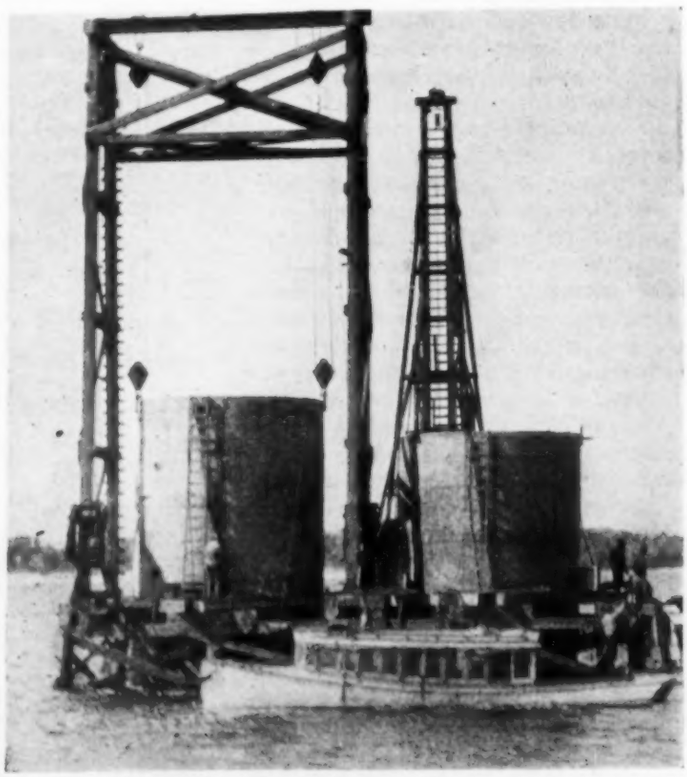
line on a boom, a 2,500-gal. steel water tank, a 3x2x3-in. Worthington boiler feed-pump supplying fresh water to the boiler and a 9½-in. Westinghouse locomotive air pump to furnish air. A 7x12-in. American deck engine is mounted on each scow for moving around.

Floating Concrete Plant

The concrete plant is mounted on a 30x90-ft. scow. The mixer is a 1-yd. Lakewood unit with a 20-hp. steam engine and a Lakewood batch meter. Sand and gravel are unloaded from material scows by a 8¼x10-in. three-drum American hoist (with boiler mounted on the rear of the scow) on a Dravo-Doyle whirley equipped with a 60-ft. wooden boom and a 1¼-yd. Erie clamshell bucket. The material is dumped into a 39-ton Blaw-Knox duplex steel charging bin with batchers. The swinging is done by a 5x7-in. American swinging engine.

A wooden derrick, equipped with American derrick irons, is mounted on the front of the scow to raise and lower the tremie; it is operated by a three-drum, 8¼x10-in. American hoist, which also handles the concrete bucket. The wooden tower is 80 ft. high and has Ransome top and bottom sheaves; Ransome spouts handle the concrete to the tremie. The tower is unique in that it has no bracing on its front face and is open, like pile-driver leads. The tremie consists of a steel hopper in a heavy steel frame to which is attached 80 ft. of 10-in. wrought-iron pipe which can be uncoupled if shorter length is desired. An Insley quick-shift rig and bucket and an Insley receiving hopper are operated on the tower. Two fresh-water tanks of 3,300-gal. capacity each are on the plant. A 6x4x6-in. Fairbanks-Morse pump raises water to the mixer; there is also a 3x2x3-in. Worthington boiler-feed pump. The plant is equipped with electric lights furnished by 1½-kw. and 1-kw. Moon steam turbine generators. Steam for the entire plant, with the exception of the whirley, is furnished





SINKING STEEL SHELLS in deep water for two of the bridge piers. Winches lower the tubes from a specially constructed A-frame on pile and timber falsework erected at each pier site.

DUMPING SPAN, 40 ft. long, at contractors' 475-ft. dock, simplifies loading of sand and gravel from railway cars to scows.

by a 60-hp. Scotch marine boiler unit.

Cement is conveyed up to the charging platform from the cement scow by a 40-ft. Northern conveyor operated by a LeRoi gasoline engine. This conveyor is mounted on the cement scow.

Pile Drivers

The pile driver is mounted on a 26x85-ft. scow. It has 76-ft. leads with Lindsley head blocks and uses an American drop hammer with an American follower for driving falsework piling. When driving foundation piling in the tubes the driver is equipped with an 80-ft. wooden shear-leg boom using the leads as a mast. From the shear-leg is hung a set of 54-ft. swinging leads which contain a McKiernan-Terry steam hammer and a 36-ft. steel spud extension above the hammer. These swinging leads, with the hammer, can be lowered to any depth under water when driving. Special cast-iron weights are attached to the piling to hold the end down and the butt is held in a McKiernan-Terry pipe extension when driving under water. Foundation piling 80 ft. long has been driven with these leads, with the hammer and butt of the piling 35 ft. under water. Shear-leg and swinging leads have 18-in. triple and 20-in. double American steel blocks.

A 9x10-in. three-drum American hoist with boiler handles the lines for the shear-leg, hammer and pile and also has niggerheads for shifting. A 9x10-in. two-drum Mundy hoist handles the leads and pile weights with niggerheads for shifting. A 6¼x10-in. two-drum American hoist is mounted on the rear of the scow for handling the anchor lines.

Two 10x7x10-in. Worthington jet pumps furnish water for jetting and a 3x2x3-in. Worthington boiler feed pump furnishes water to boilers. All steam for steam hammer and other machines, except the American hoist, is

CHARLES E. RYAN, general superintendent of the Northwest Florida Corporation.

furnished by a 60-hp. Scotch marine boiler. The rig is equipped with electric lights from a 1-kw. Moon steam generator. An 8x8-in. Chicago Pneumatic steam-driven compressor furnishes air for the steam hammer for under-water driving and also for all boring for bracing falsework. All boring is done with an Ingersoll-Rand air wood borer.

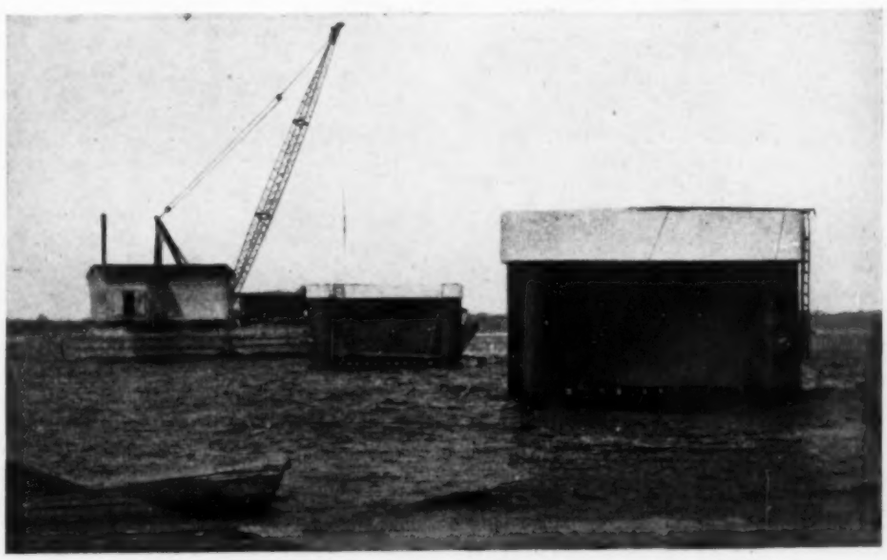
All freight shipments are received at the yard in Panama City which is about 4 miles by water from both bridges. The yard is located on the Atlanta & St. Andrews Bay Railway and the dock is 475 ft. long with a 40-ft. dumping span for delivering sand and gravel onto scows.

The marine equipment consists of a 100-hp. Fairbanks-Morse tug, a 60-hp. Fairbanks-Morse tug, a 40-hp. gasoline tug and two gasoline launches of 30 and 20 hp.

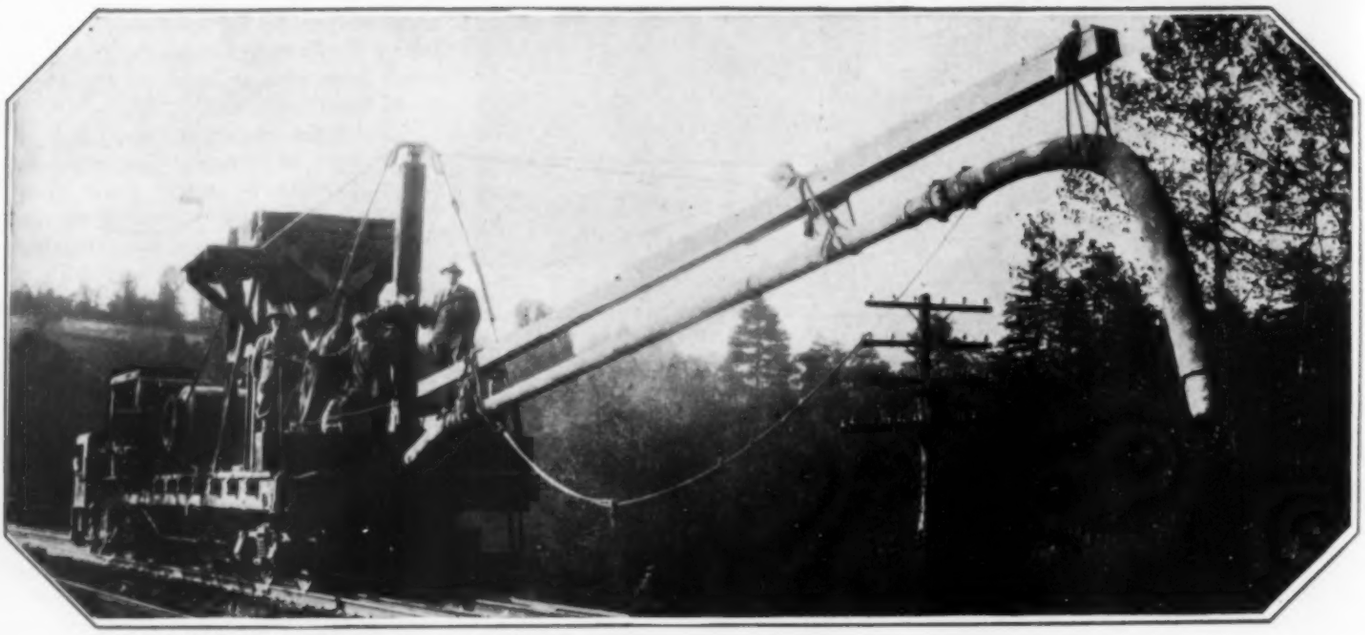
A résumé of the quantities which will go into the two bridges should be of interest: The wood foundation piles if laid end to end would extend over 20 miles. The concrete piles supporting the approach spans, if set one on top of the other, would form a column nearly 3 miles high. It would take a solid train of freight cars over 10 miles long to haul the sand, gravel and cement for the concrete in the two bridges.

Personnel—The contract is with the State Road Department of Florida; Dr. Fons A. Hathaway, chairman of the board; J. L. Cresap, chief engineer; R. L. Bannerman, division engineer; George L. Derrick, bridge engineer; E. L. Hanes, project engineer, East Bay bridge; and S. G. French, project engineer, West Bay bridge.

The construction work is being handled by Charles E. Ryan, general superintendent and P. R. Johnson, manager, under the direction of N. F. Helmers, vice-president of the Northwest Florida Corporation.



COMPLETED PIERS on the West Bay bridge with wing walls and caps in place ready for the steel superstructure.

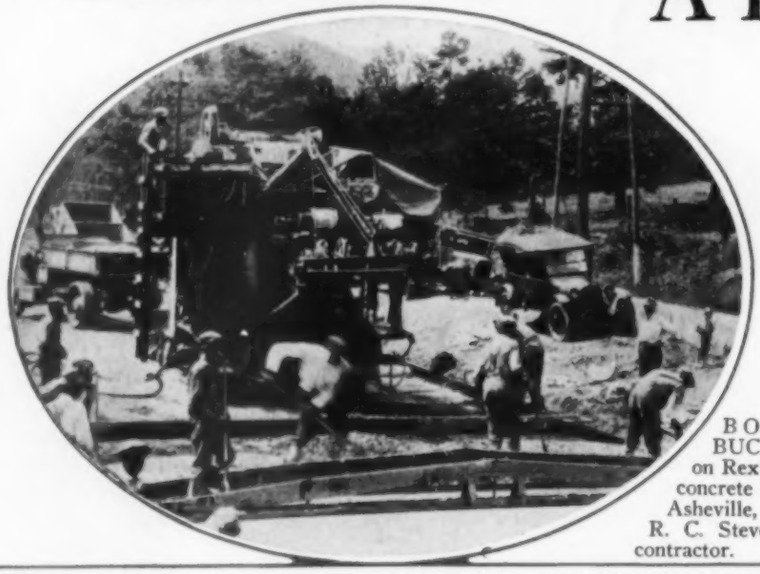


PNEUMATIC MACHINE, a Ransome unit, on flat-car mounting, places concrete in C. & O. R.R. tunnel for Walton Construction Co. of Roanoke, Va.

A DOZEN WAYS OF *from Mixer*

FOR every type of job there are different methods and equipment for getting concrete from mixer to forms. Here are a dozen ways. There are dozens of *others*.

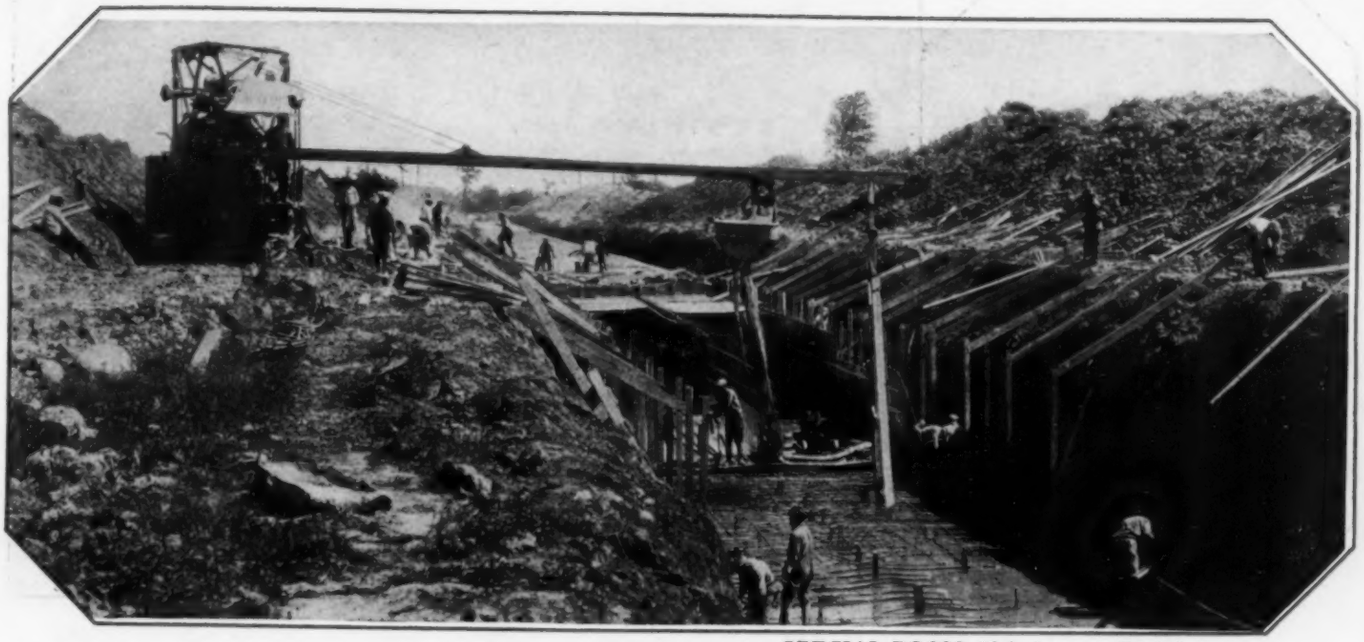
Haven't *you* a picture to add to the collection? Something different in plant set-up



BOOM AND BUCKET *(left)* on Rex mixer paves concrete road near Asheville, N. C., for R. C. Stevens, general contractor.

BUCKET on Northwest locomotive crane raises concrete to place for the inlet conduits of the new Kansas City water-works.

CABLEWAYS, too, offer still another means of getting concrete to place on a large bridge job.



SPECIAL BOOM, 45 ft. long, on Koehring paver simplifies the delivery of concrete for invert, sidewalls and roof of a big sewer.

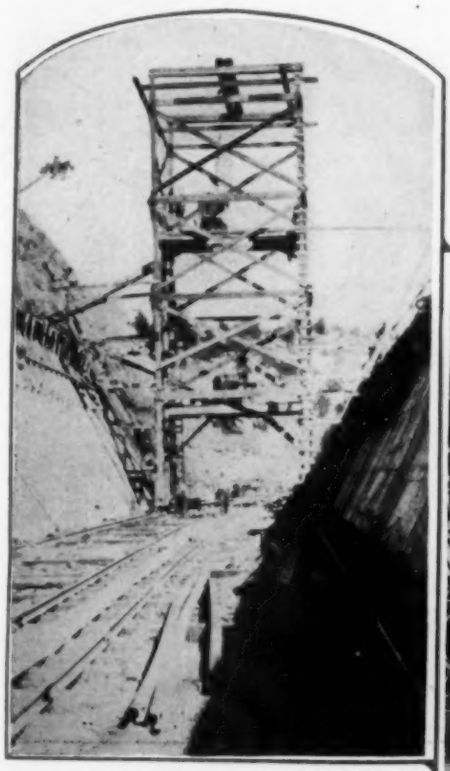
GETTING CONCRETE *to Forms*

or some combination of equipment that you found effective?

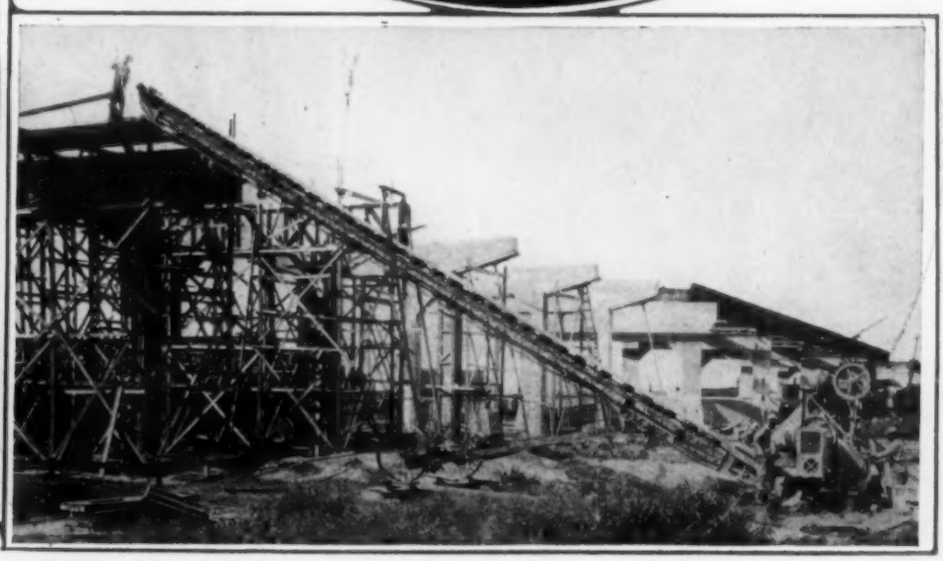
Mail the Editor a snap shot; payment at regular rates, of course, for all pictures published.

(Other concreting pictures on next page)

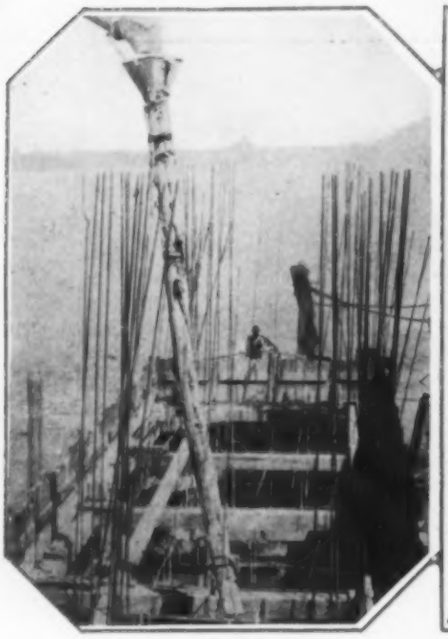
INCLINED TRACK *(right)* and car, a Jaeger rig, does the trick on a concrete wall job.



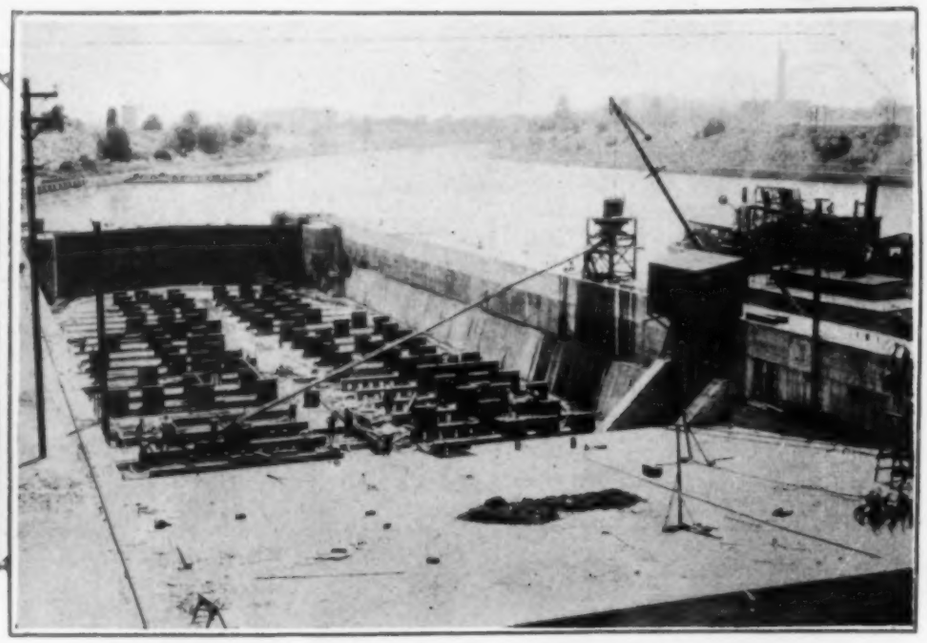
MOVABLE TOWER, with hoist, picks up concrete buckets from flat cars for canal lining.



BELT CONVEYOR carries wet concrete to place up steep incline on pier construction for Seventh Street viaduct, Decatur, Ill.



TREMIE method proves helpful when it becomes necessary to place concrete under water.



INCLINED CHUTE from hopper receives concrete from floating plant for dry-dock construction at Louisville, Ky.

MORE WAYS OF GETTING CONCRETE

from Mixer to Forms

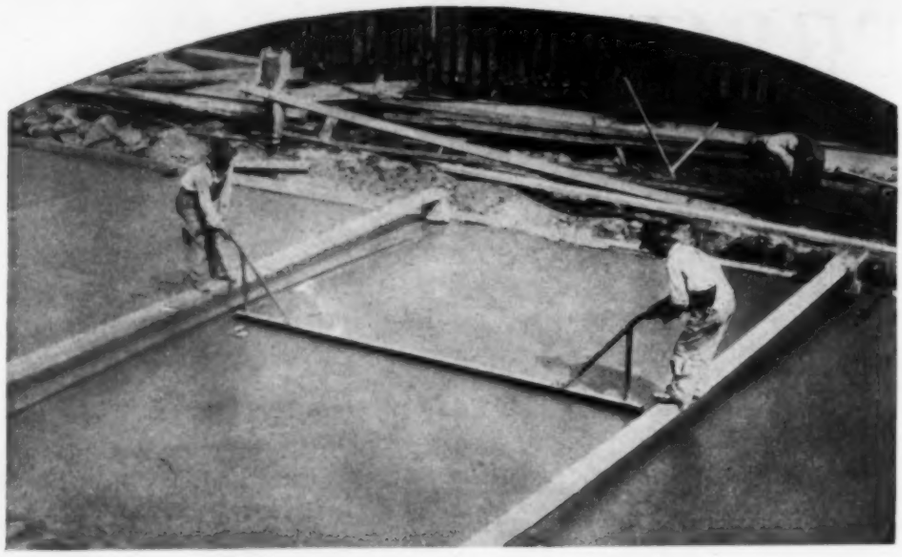
LIGHT MOTOR TRUCK fed by inclined chute delivers concrete to place for reservoir lining.

TOWER AND CHUTE system, Insley type, as used by the Ross Construction Co. for the concreting of the Big Santa Anita dam near Los Angeles.

PRECAST SLABS
for Grandstand Tiers

BASEBALL fans at Atlanta, Ga., are assured of a good view of the game as a result of grandstand construction employing precast cement tile slabs for the tiers. Following plans of Roberts & Co., engineers, the Griffin-Hodges Co., of Atlanta, installed 35,000 sq.ft. of American flat Cementile, $1\frac{3}{4}$ in. thick, laid at a slope of $\frac{3}{16}$ in. to 1 ft. to facilitate drainage. Joints were pointed with Lastik cement. The slabs were carried on steel channel supports and 2x2x$\frac{3}{16}$-in. facia angle made a finish and acted as a stop for the tile slabs.

SEATING TIERS were formed by precast flat tile slabs, sloped slightly for drainage. SEATS (*in oval*) were connected to supporting structural steel floor channels.



1 A STEEL T-BAR (*right*) with handles forms the 2-in. slot in the finished concrete surface at the exact center of the street.

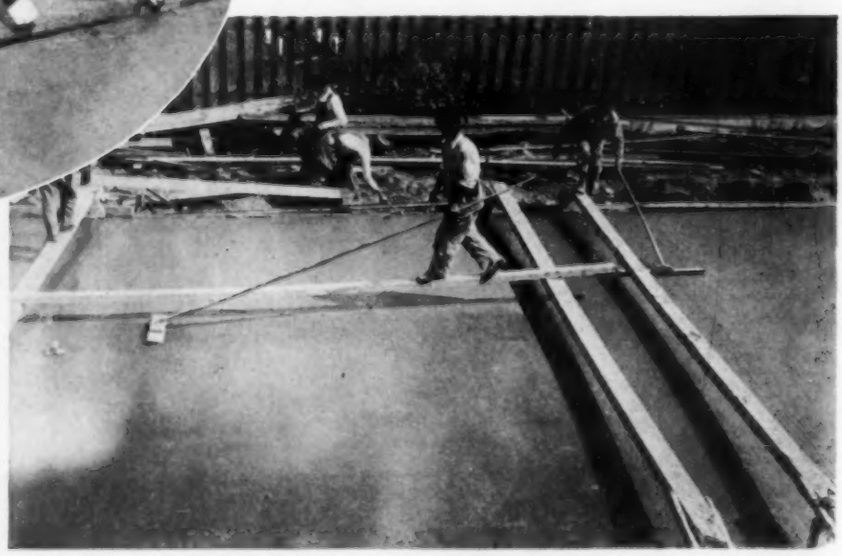
Step-by-Step Surface Slots Road Slab

2 CLOSE-UP OF SLOT (*left*) ready to receive 2-in. joint material.

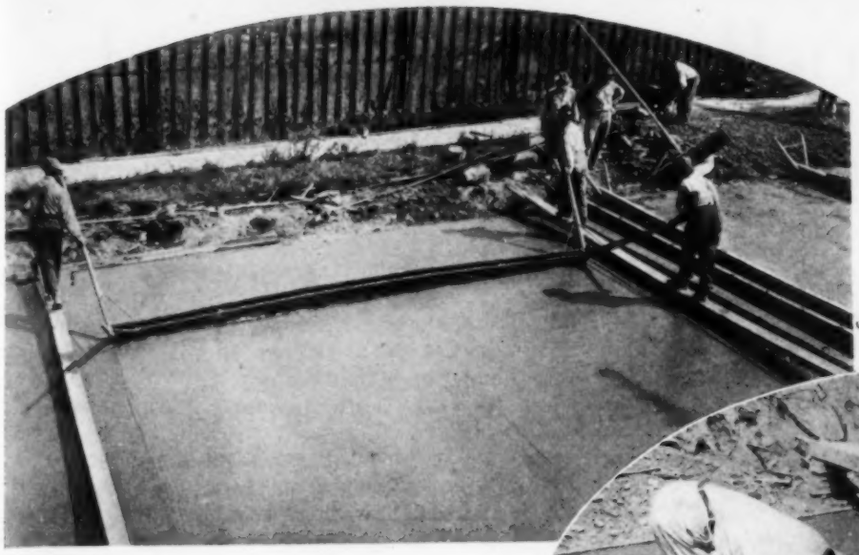
A "DUMMY" joint has been developed by W. H. Tiedeman, principal assistant city engineer of Seattle, Wash., to eliminate cracks and improve the riding qualities of the city's concrete pavements.

In Seattle the standard width of residence street pavements is 25 ft. Full depth transverse expansion joints are put in every 60 ft. This 60-ft. panel length is subdivided by transverse dummy joints spaced at 15-ft. intervals. A longitudinal dummy joint runs through the

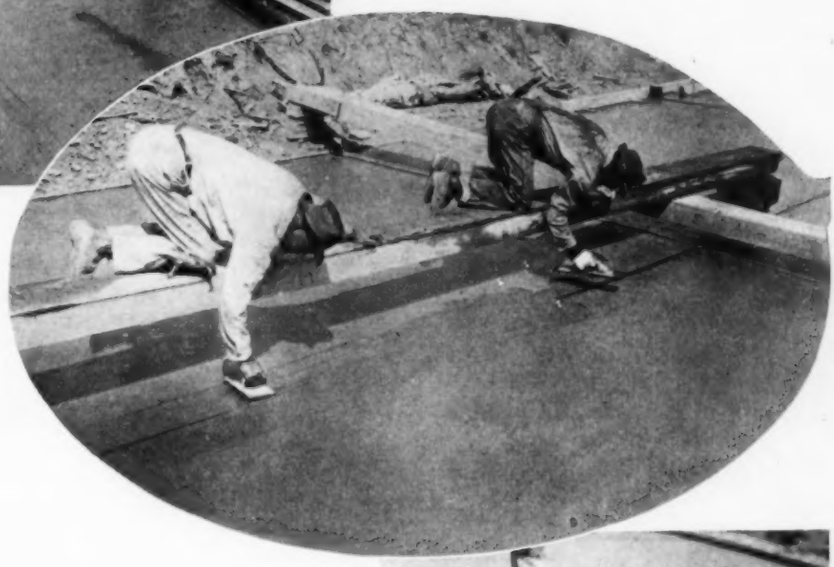
3 FILLER STRIP *(left)* 2 in. in width, is placed in slot and tamped lightly with a hand float.



4 LONGITUDINAL FLOATING *(right)* is carried over transverse dummy joint after filler has been inserted.



5 CONCRETE (*left*) is floated toward and over the filler strip, leaving it flush with the surface.



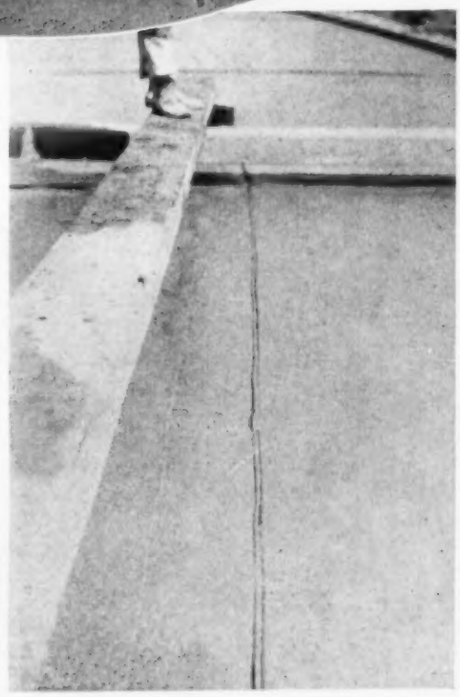
Field Methods to Prevent Cracks

center of the pavement, thus giving the sub-panels dimensions of 15x12½ ft.

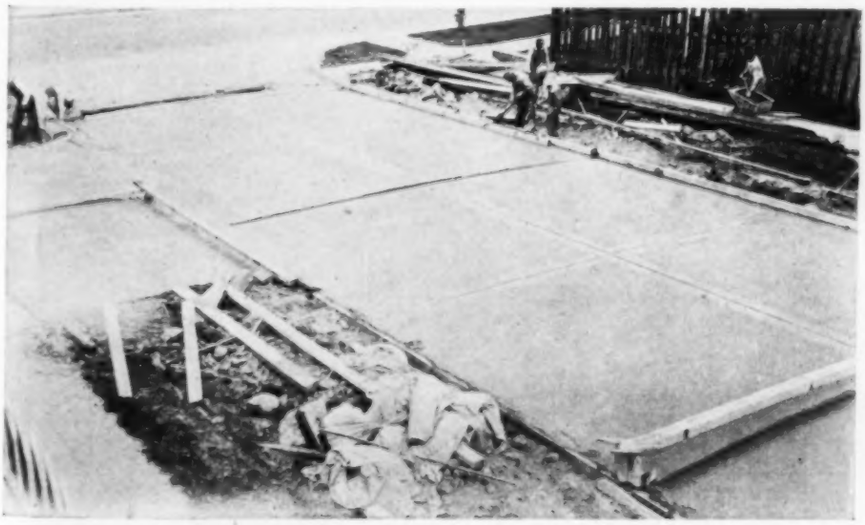
The dummy joint is a surface slot, 2 in. deep, filled with Elastite. The advantage of the joint is that, when the pavement cracks, the break occurs in the plane of weakness developed by the slot, and the irregularity of the fracture prevents subsidence of the slab on either side of the joint, while the filler in the joint hides the crack from sight and stops the seepage of water.

The photographs illustrating this dummy joint construction were taken on the street paving jobs of McHugh & Collucio and Fiorito Bros., of Seattle.

6 CONCRETE (*above*) is edged along the 2-in. filler strip with the 6-in. edger.



7 FINISHED DUMMY JOINT (*right*). Transverse and longitudinal joints are constructed at different times.



8 COMPLETED PAVEMENT (*left*) showing several of the 15x12½-ft. sub-panels.

"Merry-Go-Round" Method

Makes Wall Building Continuous

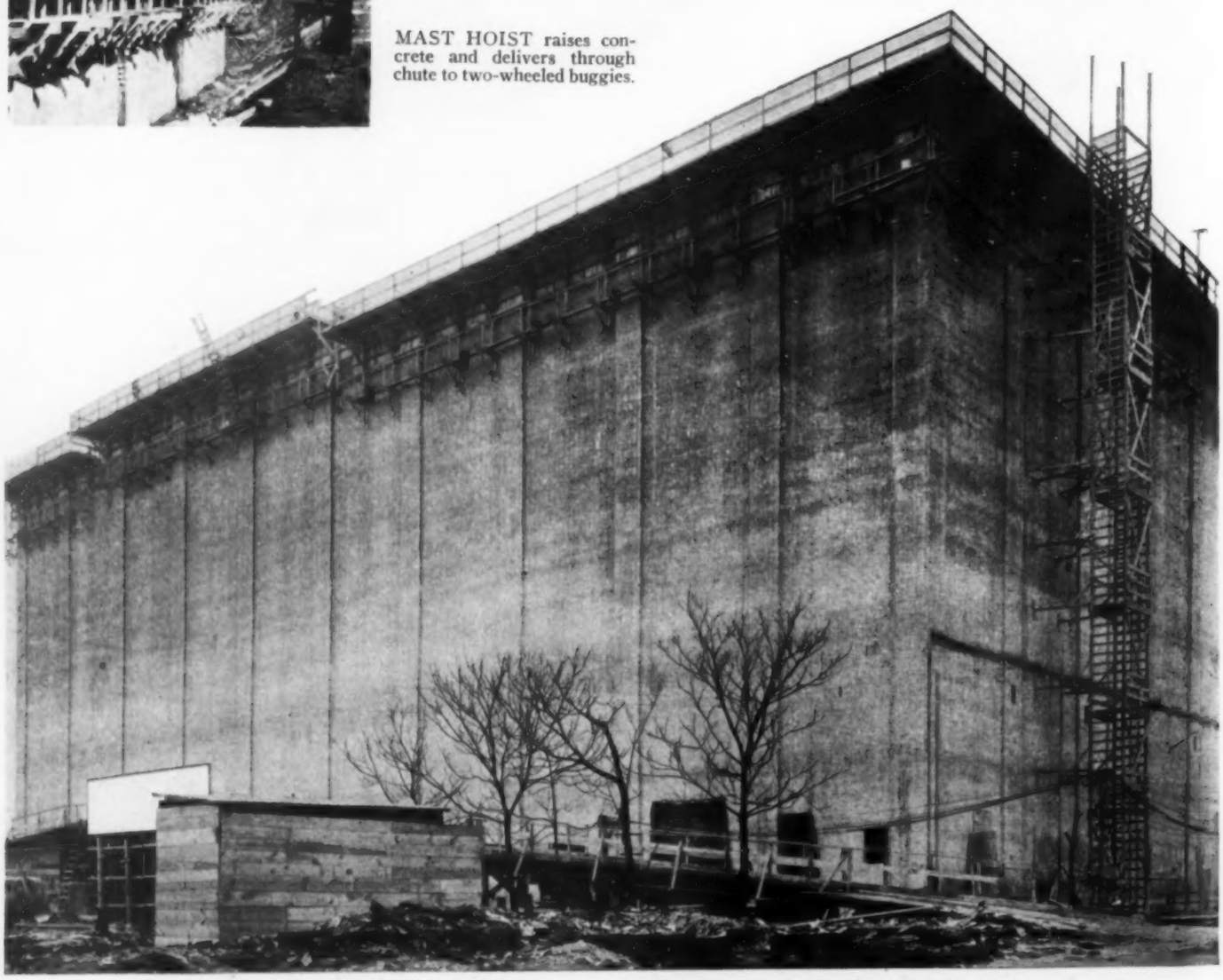
SLIDING forms and continuous pouring of concrete in 4-in. layers by a steadily moving line of buggy pushers, resembling a merry-go-round in action, made it possible for the E. W. Sproul Construction Co., of Chicago, to complete in 12½ working days 6,500 cu.yd. of concrete for the double walls of the seven-story cold storage plant of the City Fuel & Ice Co. at Cleveland, Ohio.

The building on which this noteworthy run was made is 200 ft. square and 94 ft. high. Its double walls, 12 and 16 in. thick, respectively, with a 12-in. cork-filled insulating space between, are windowless. At each floor level horizontal slots are cast in the walls to receive the edges of the concrete floor slabs.

The wall-pouring job was undertaken in cold weather (Nov. 9-21), and speed was essential. The contractor planned to carry on work day and night with three 8-hr. shifts. Workability of the low-slump concrete mixture used was secured by adding 3 lb. of Celite per bag of cement.

From a ¾-yd. Smith mixer, operated by electric motor at ground level, concrete was raised by a mast hoist to a hopper feeding a fleet of two-wheeled

MAST HOIST raises concrete and delivers through chute to two-wheeled buggies.



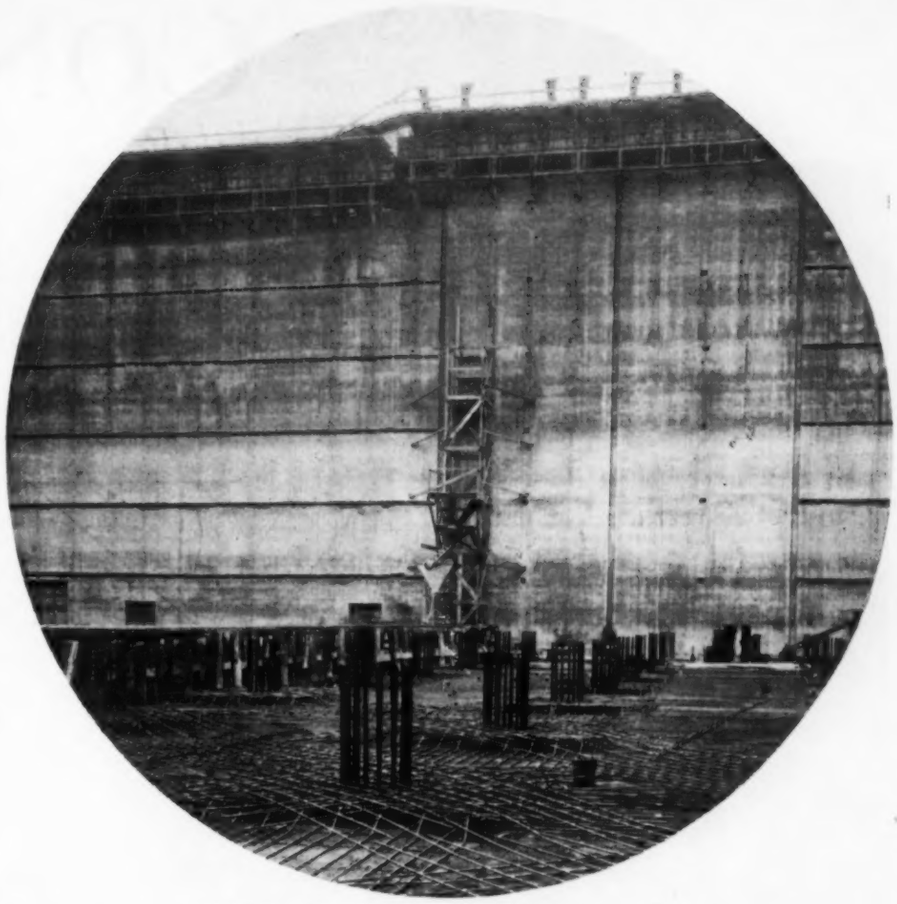
SLIDING FORMS with lifting yokes carrying two runways and a finishing platform below made a complete circuit of the building and were raised continuously as concreting progressed in 4-in. lifts.

concrete buggies pushed by hand around a pair of runways above the wall forms. To receive the concrete, the contractor set up around the building a continuous line of special sliding forms moved vertically by a system of threaded rods and lifting yokes. These yokes also supported the inner and outer concrete runways and a finishing platform below, so that everything moved upward as a unit when the wall forms were raised.

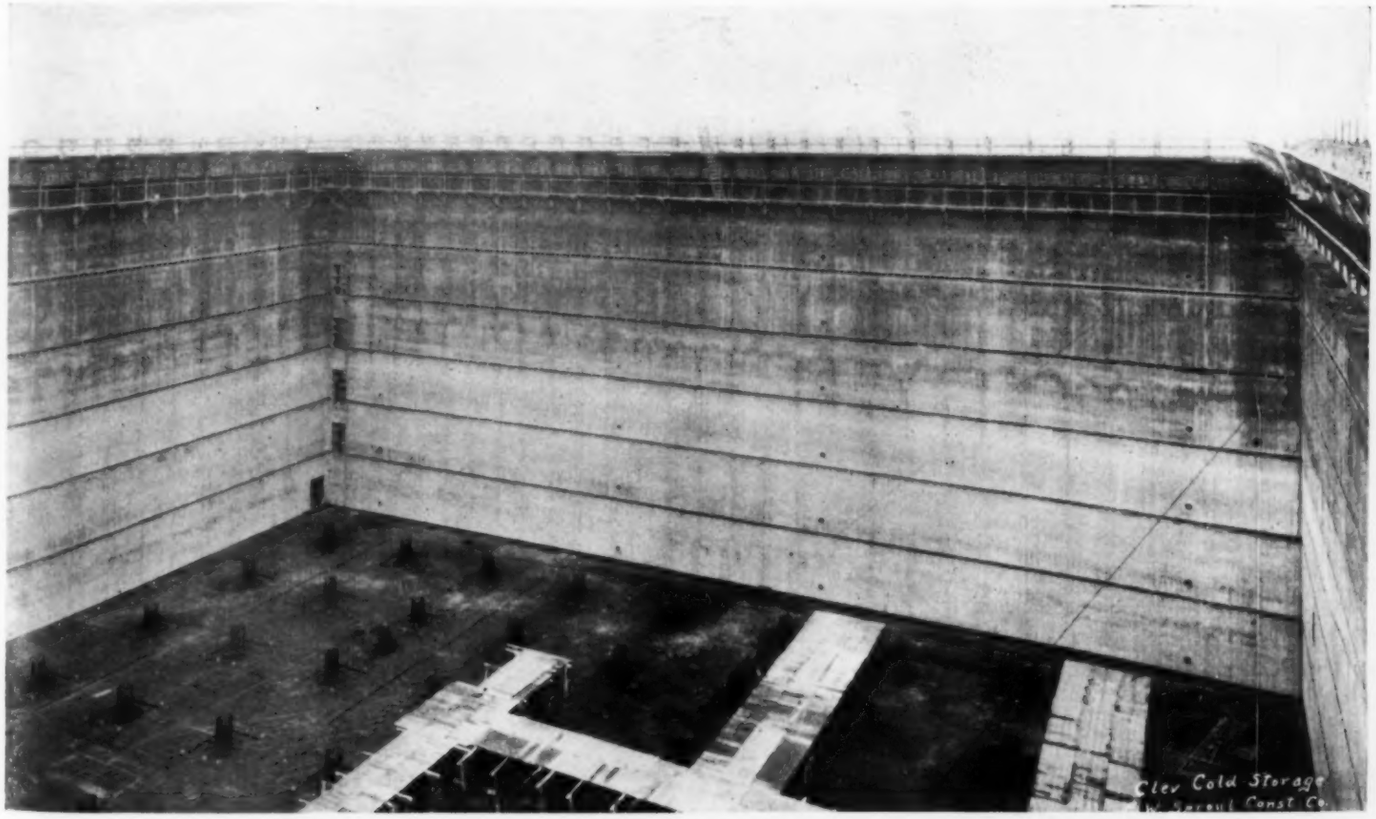
The concreting was done in layers 4 in. deep by a crew of eight buggymen per shift. These buggy pushers kept making a continuous circuit of the building, depositing their loads of concrete and then returning to the hopper for a new batch. The average time for a trip was 3 min. and each man covered a distance of about 24 miles per shift—practically the same distance as the standard Marathon run.

Two crews of eight jackmen kept raising the sliding forms for the next 4-in. lift. The pace was so rapid that new concrete was exposed as the forms rose, 9 hr. after placing. Both sections of the double wall were concreted simultaneously.

COMING: A picture story showing the wide range of construction operations involved in creating the big airport at Port Newark, N. J., including photos of erecting 120-ft. steel trusses for an airplane hangar.



INNER AND OUTER WALLS were concreted simultaneously, leaving 12-in. insulating space between. Wall forms at right have just been lifted.



SLOTS were cast in the inner walls at each floor level to receive the edges of the concrete floor slabs.

CONCRETE

TRUCK-MOUNTED MIXER deposits its load at spot desired through gate in rear.

SALE and delivery of concrete ready mixed for immediate placing in forms on the job has developed into a specialized business in a number of cities. To serve contractors, industrial plants, public utilities and other organizations using concrete in the Pittsburgh district, the Keystone Sand & Supply Company is operating from a yard and loading plant along the river front a fleet of five Barrymore mixers mounted on Mack and White trucks making deliveries anywhere within the metropolitan area. Two additional plants of the same sort are to be installed in other sections of the city at an early date, according to A. W. Dann, vice-president of the Keystone company.

Sand and gravel arrive in barges at the loading plant and are delivered by clamshell buckets and Dravo whirler cranes either to stock piles or direct to Johnson bins which feed measured batches of aggregate and cement into the drums of the

OVERHEAD BINS facilitate loading of weighed charges of cement, sand and gravel. Water, proportioned by regulator, is not discharged onto aggregates, but is admitted to separate tanks along upper sides of mixer body and released when mixing starts at the job.

à la Cart

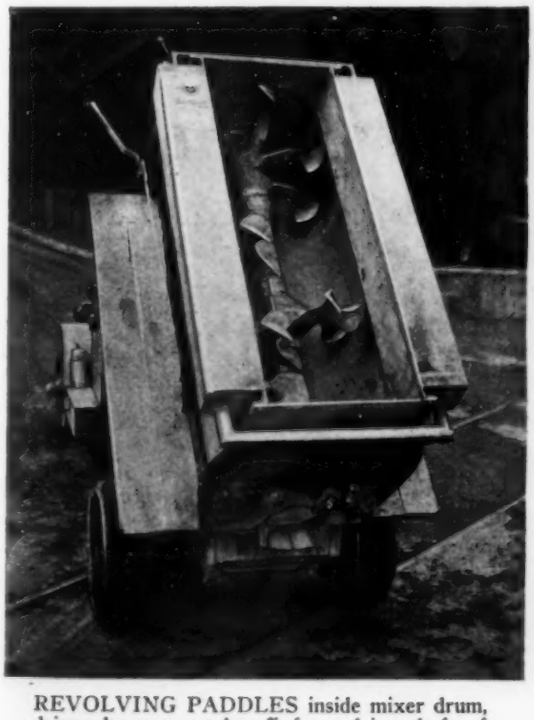
truck-mounted mixers. Rowland Jones, superintendent at the loading plant, has installed a belt conveyor to deliver cement from a storage shed to the overhead bins.

The truck-mounted mixers are horizontal cylindrical drums, with open tops, each holding a 2-yd. batch. Revolving paddles on a horizontal shaft taking its power from the truck engine do the mixing *after* the truck reaches the job—there is no mixing done at the loading plant or while the truck is in transit.

Another important point is that the batch is hauled to the job *dry*. Water, in proper amounts per batch, is measured at the loading plant and then discharged into tanks at the top of the mixer drum, so that it does not come into contact with the dry aggregates until released just before actual mixing starts. Elevating bodies on the truck facilitate end dumping.

COMING: "Islands Built to Order," a picture story telling how construction men, by dredging and sea-wall construction, transformed the mud flats of Tampa Bay into Davis Islands, an attractive residential section of a thriving Florida city. Here's one of those out-of-the-ordinary jobs that have a real interest for every construction man.

WHIRLER CRANE charges bins from barges. At right of bins is cement house from which belt conveyor elevates loose cement to bin above charging hopper.



REVOLVING PADDLES inside mixer drum, driven by power take-off from drive shaft of truck, mix concrete at job.

SMALL GATE in rear of mixer is used for loading wheelbarrows or where only small quantities of mixed concrete are needed. Capacity of mixers is 2 cu.yd.

Two Ways to SHEET

(Left to right) KNOX KERSHAW, of Royce Kershaw, Inc.; R. E. HOUSTON, foreman, and H. L. EBSARY, of the Ebsary Foundation Co.

RECENT construction activities in Florida have involved the driving of a large amount of steel sheet piling for docks, bulkhead walls, beach protection works and other types of waterfront improvement. Typical construction details of two sheet-pile driving jobs are pictured on the pages herewith.

At Bay Mabel—On the left-hand page are views of the method of aligning and driving steel sheet piles for the new slip walls at Bay Mabel between Fort Lauderdale and Hollywood. This job is being handled by Royce Kershaw, Inc., of Jacksonville (under a sub-contract from the Tropical Dredging & Construction Co., of Hollywood), and the Ebsary Foundation Co., of Miami. The chief items of equipment included a derrick barge, pile driving barge and scows. The ordinary method of aligning the piles by guide walers was impossible be-

TEMPLATE (*above*) is accurately aligned by measuring from tacks set by engineers in timber anchor piles. Pipe spud shown at right.

NEW TEMPLATE (*below*) is placed over spud and piles.

DRIFT PIN (*above*) in old waler temporarily holds template.

TIE RODS (*right*) connected to anchor pile, make bracing secure. Before day's work ends, piles are driven to rock.

Align and Drive PILES

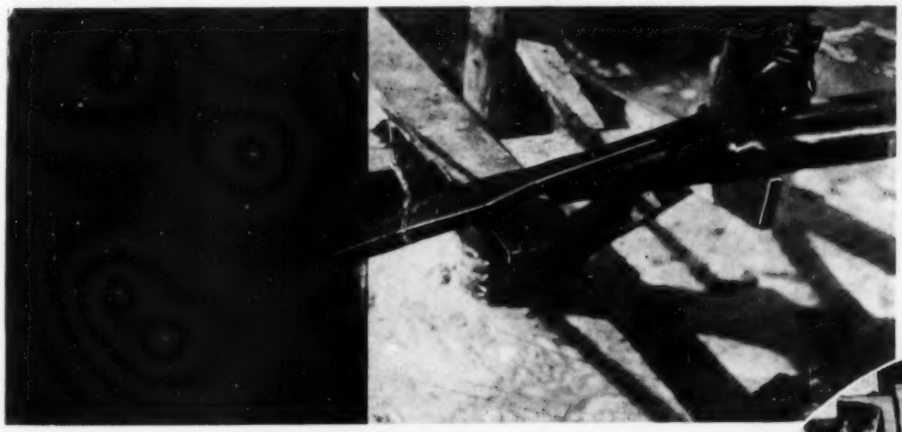
cause of the 35-ft. depth of water. Timber piles would have floated before they touched bottom and the difficulty of driving them made some other method desirable. An alternative method, using a 42-ft. length of 5-in. pipe as a spud and braced walers, worked satisfactorily. Four different lengths of steel pile sheeting were driven: 39, 43, 45½ and 49½ ft. The general method illustrated is the one always used; details vary with each template.

At Key Biscayne—On the right-hand page are illustrated the methods used to jet sheet piles for bulkhead construction at Key Biscayne, Miami, by G. O. Reed, Inc., contractor, of Miami Beach. Here the plant included a large work barge and P&H crane, four small barges, a Vulcan 2,000-lb. drop-hammer and Larssen steel sheet piles with an effective width of 15¾ in. and a weight of 32.8 lb. per foot.

(*Left to right*) GEORGE STARRETT, foreman, and HARRY C. McCLURE, superintendent for G. O. Reed, Inc., contractors, of Miami Beach.

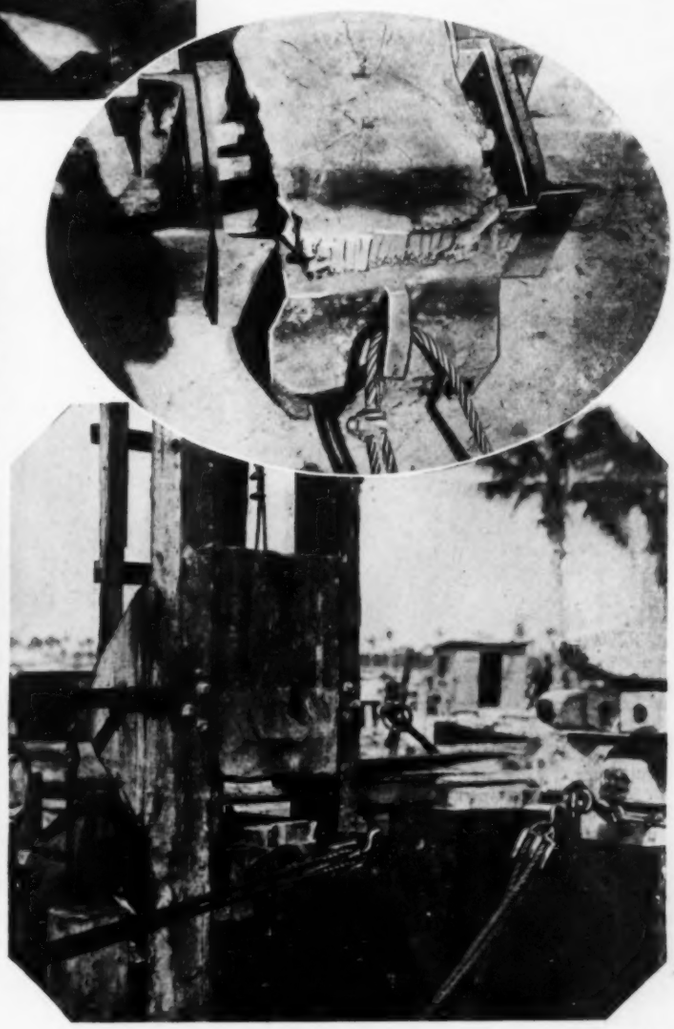
LEVERS (*left*) guided piles and held them against alignment waler during jetting.

CHANNELS (*below*) riveted to sides of pile cap, insured fit in leads. Cap goes over two piles.



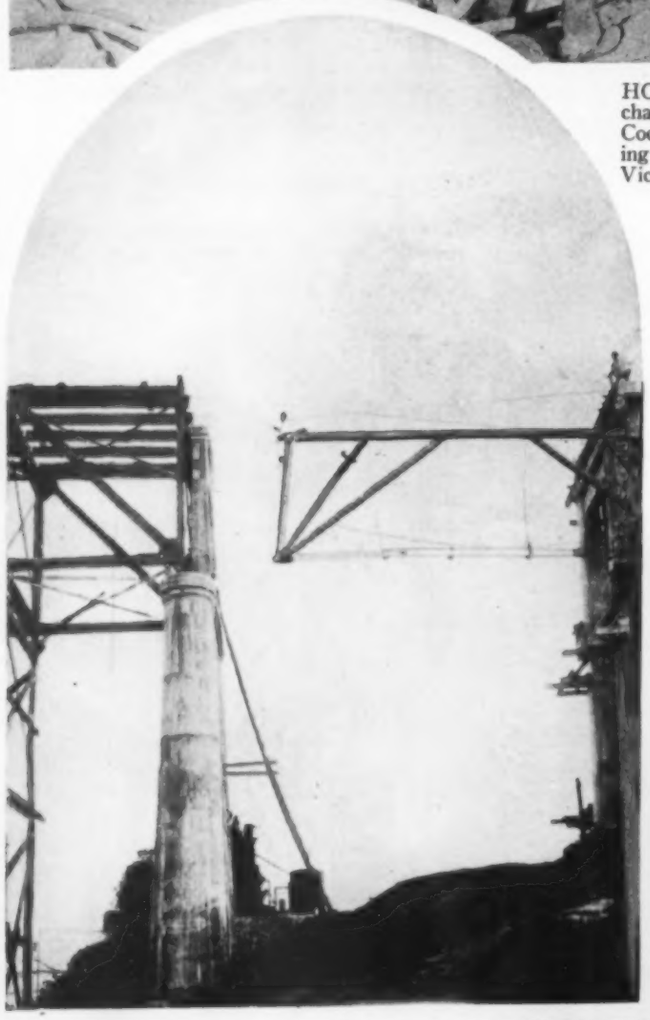
JETTING (*below*) carried the piles down to rock. An alignment waler kept them in proper position.

CAP (*right*) was picked up by the hammer and fitted over the piles for driving.



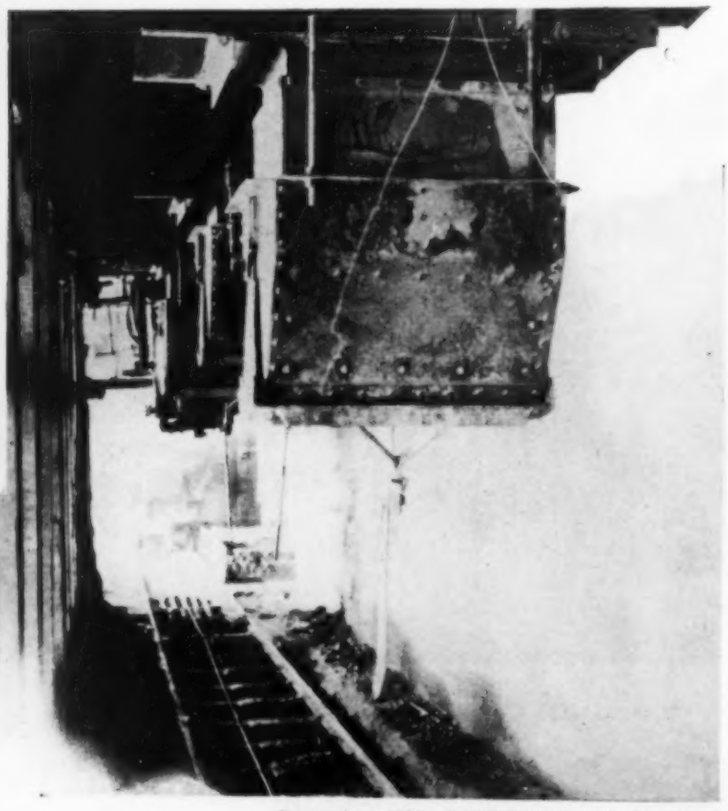
HORIZONTAL BAR MOUNTING *(above)* for drills facilitates channeling or broaching at quarry of Beaver Dam Marble Co., Cockeysville, Md. Drills put in 1¼-in. holes 6 to 8 ft. deep and broaching bar then cuts out cores between holes. "Economical and fast," is Vice-President Martin's comment on this method.

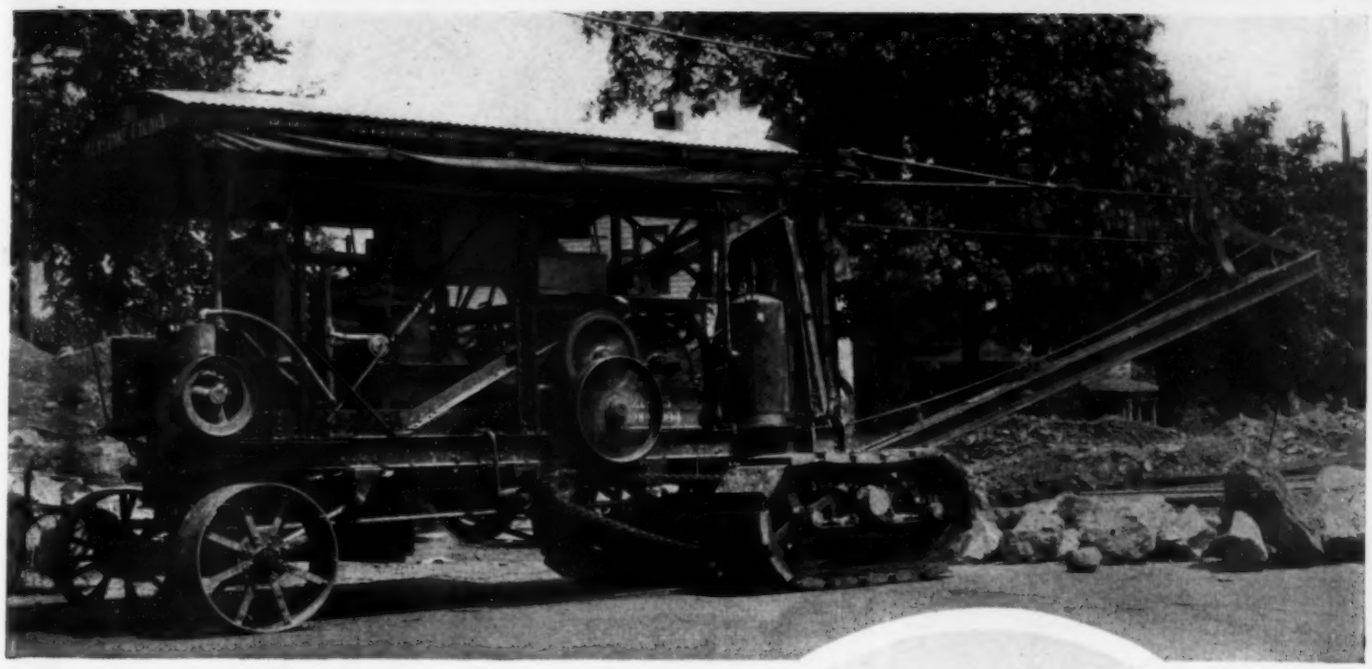
Getting Down to



FAN TRUSSES *(above)*, built with reinforcing steel, supported deck and girder forms for Fort Gaines bridge in Georgia, after flood had washed out false work. For these trusses Mallory & Nash, Atlanta contractors, used 1¼-in. square tension rods and 2-in. pine compression members. They were placed with the aid of ⅝-in. cables on the forward end and rollers on the rear end.

TRIPPED AUTOMATICALLY *(below)*. Bent Bros., contractors, installed handles on hopper gates of batchers at Pacoima dam, in Los Angeles County Flood Control District, to strike cars as they are pulled along track by hoist and release discharge gates.

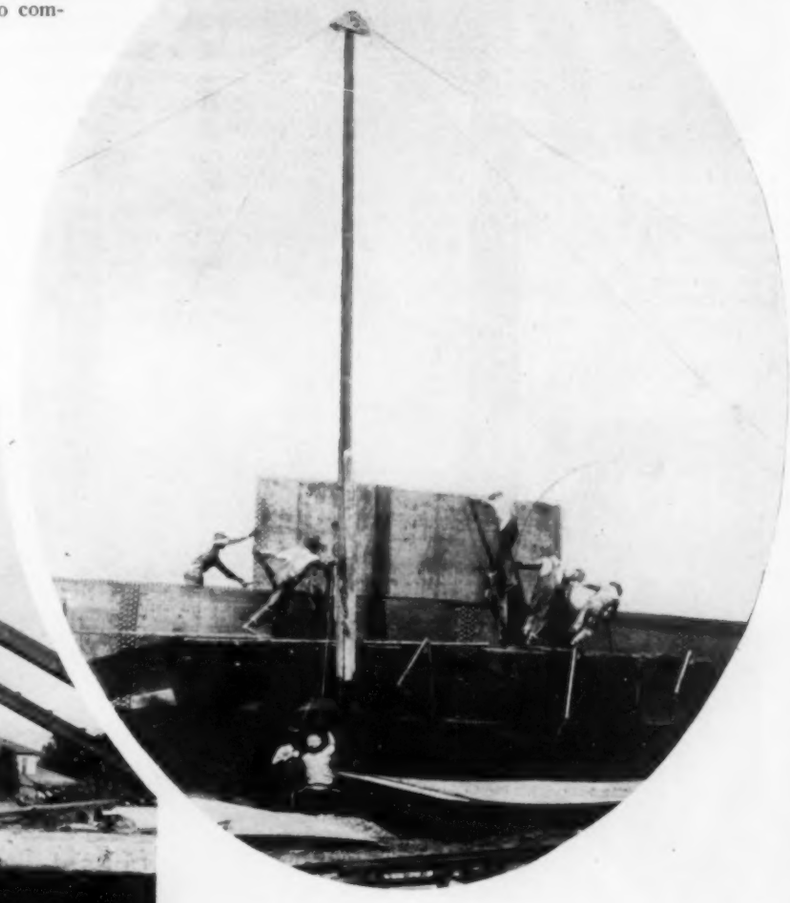




A TWO-IN-ONE RIG *(above)*. For trenching work a Keystone excavator, fitted with dragline bucket, and a Chicago Pneumatic air compressor, are carried on same mounting. When excavator strikes rock, the contractor hooks up drills to compressor.

DETAILS

TROLLEY RIG *(right)*, with wheels riding on tops of steel plates already in place, aids the setting of plates raised by mast derrick for next ring of one of the Roxana Petroleum Corporation's 80,000-bbl. oil tanks at Cushing, Okla.

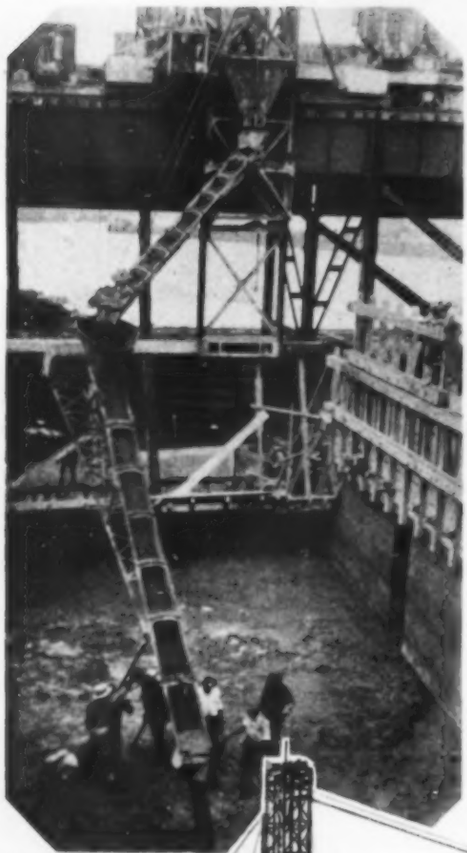


GOING DOWN! *(left)* How the East Bay Municipal Utility District, Oakland, Calif., handles the lowering of the submarine pipe line for the Middle River crossing.

Hasn't YOUR work developed some interesting detail or "kink"? The Editor of *Construction Methods* would like a close-up snap shot of it. Why not mail it today?

FORESIGHT AND

Smoothed Builders'

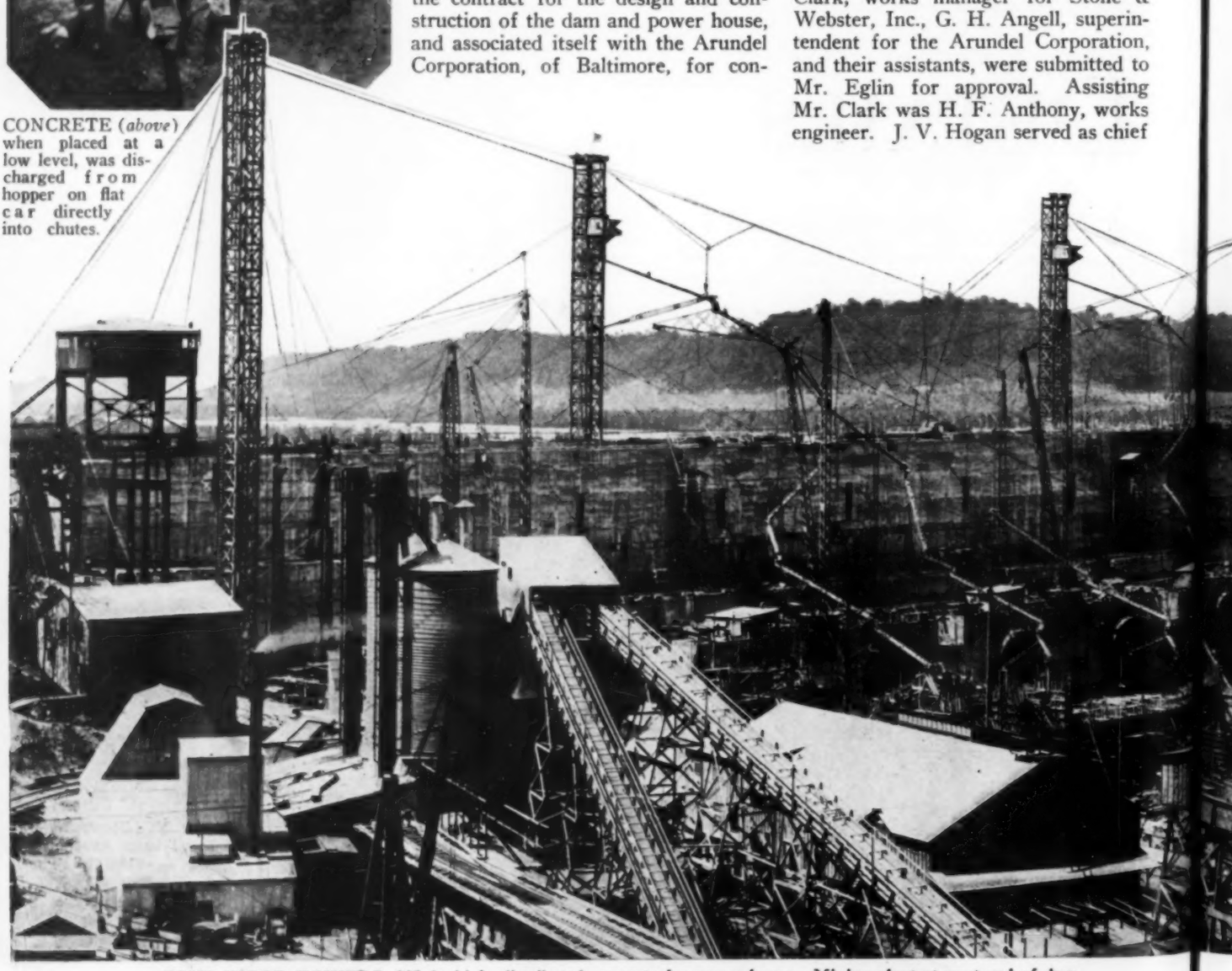


CONCRETE (*above*) when placed at a low level, was discharged from hopper on flat car directly into chutes.

PLANS for constructing the Conowingo power development on the Susquehanna River in Maryland, involving a long concrete dam and power house, were worked out in the offices of Stone & Webster, Inc., before any order to proceed was issued by the owner, the Susquehanna Power Company, subsidiary of the Philadelphia Electric Company. A master progress chart showed all major operations, while numerous sub-charts carried schedules for the minor operations.

Stone & Webster, Inc., was awarded the contract for the design and construction of the dam and power house, and associated itself with the Arundel Corporation, of Baltimore, for construction of the spillway and east abutment sections of the dam. The Arundel Corporation, under another contract, also moved 17 miles of the Pennsylvania Railroad branch in the area to be flooded.

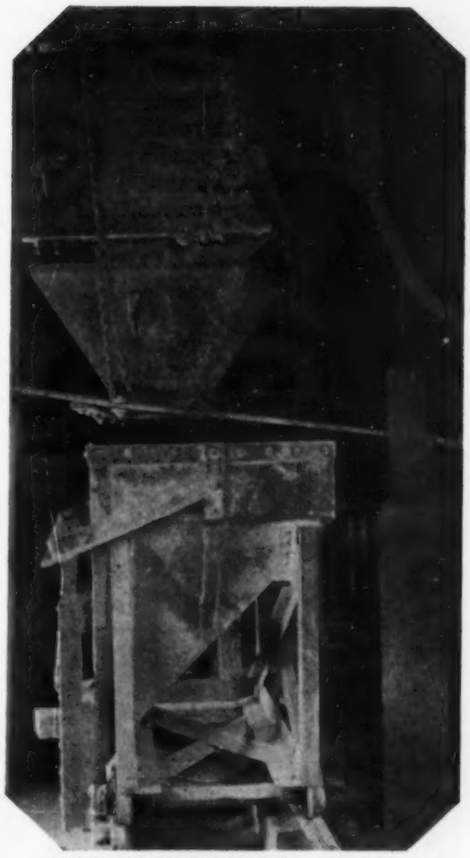
Co-operation was maintained between the two organizations. Weekly conferences, presided over, up to the time of his death, by William C. L. Eglin, vice-president and chief engineer of the Philadelphia Electric Company, were held. At these meetings, plans previously discussed by A. W. Clark, works manager for Stone & Webster, Inc., G. H. Angell, superintendent for the Arundel Corporation, and their assistants, were submitted to Mr. Eglin for approval. Assisting Mr. Clark was H. F. Anthony, works engineer. J. V. Hogan served as chief



FOUR WOOD TOWERS, 225 ft. high, distributed concrete for power house. Mixing plant at west end of dam was served by belt conveyors. Cement was received in bulk and elevated into silos..

ORGANIZATION

Path at Conowingo



WEIGHING HOPPER, one of two at Stone & Webster plant, insured accurate cement measurement.

engineer of the Arundel Corporation.

The Dam—The dam is of the ogee gravity type, of concrete on a rock foundation. It is 4,648 ft. long and includes the power house headworks of 950 ft., the spillway section of 2,385 ft. and the remainder of retaining wall or abutment section. At its base the dam is 85 ft. wide. The average grade of the river bottom is El. 14, and the grade of the crest is El. 86. A bridge on top of the dam carries the relocated Baltimore-Philadelphia Pike across the river at El. 114.

Only part of the power house was constructed under this contract; the length of this portion is 662 ft. It incloses seven turbo-generator units with a total rated capacity of 378,000 hp. Four units to be installed later will increase the capacity to the ultimate total of 594,000 hp.

Work was started Mar. 8, 1926, just as frost was leaving the ground. On the east bank the branch railroad answered the needs of transportation, but on the west side the railroad was 9 miles away, while the nearest paved highway was 2 miles from the dam site. In spite of the difficulties, supplies were trucked in and camps on both sides of the river were operating early in May. Construction of a railroad, 8.9 miles long, connecting with the Pennsylvania main line at Havre de Grace, Md., was energetically pushed and the first carload of material was brought in to the dam site on June 3, 1926.

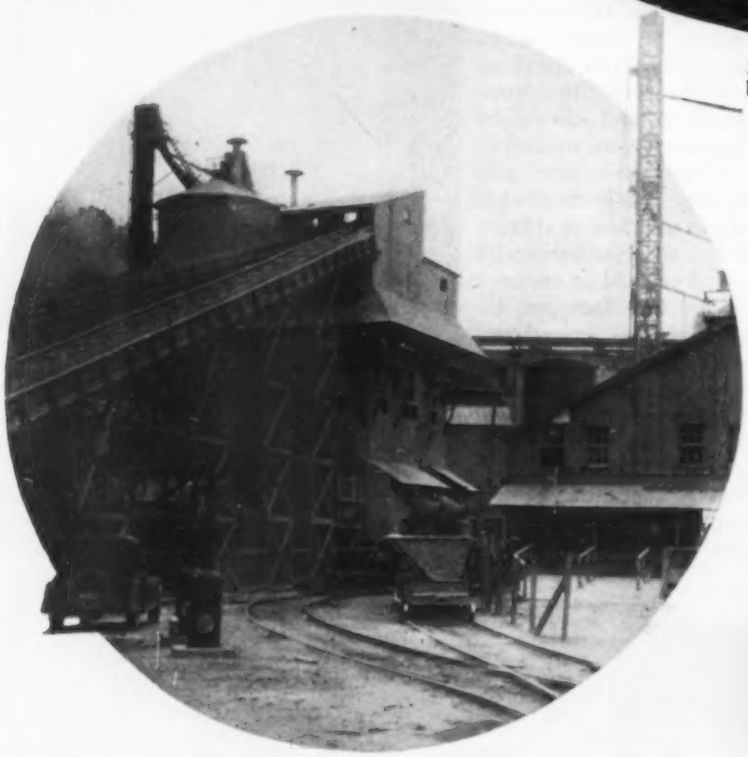
Cofferdams—Cofferdams formed the first stage of the construction program. These structures had a total length of 89,000 ft. and protected an area of 32 acres. It was out of the question to provide cofferdams that could not be topped by floods, both because of first cost and extreme height necessary. The cofferdams, therefore, were designed to withstand overflow

POWER HOUSE COFFERDAM had an area of approximately 14 acres. Belt conveyor, with trip to control point of discharge, was carried on trestle and used in storing gravel.

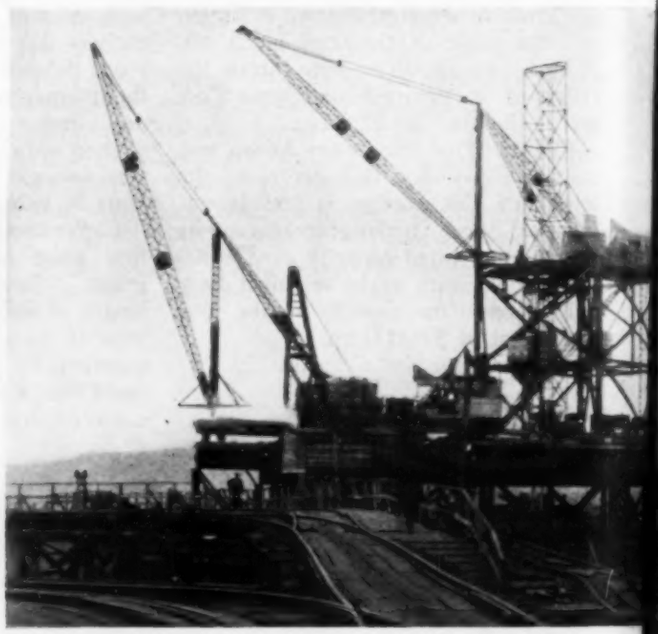
without serious damage. The flow of the Susquehanna is irregular, ranging from 2,200 to 750,000 sec.-ft.

On the west, or power-house, side, a puddle chamber crib cofferdam was built. This type, with rock-filled cribs on both sides of the puddle chamber, was decided upon because, on this side, the nearest clay suitable for fill was 8 miles away, making delays incident to repairs extreme. On the east side, however, clay was available in abundance, and here the usual rock-filled crib type of cofferdam was used with 10-ft. openings closed by 12-ft. stop logs, sheeted and clay-filled on the water side.

STEEL I-BEAMS carried railroad tracks over gap formed by removal of cribs at east side cofferdam.



TWO 2-CU.YD. MIXERS discharged concrete into roll-over type concrete cars for distribution on west end of job.



CONSTRUCTION TRESTLE carried three standard-gage tracks and rails for three traveling gantry cranes.

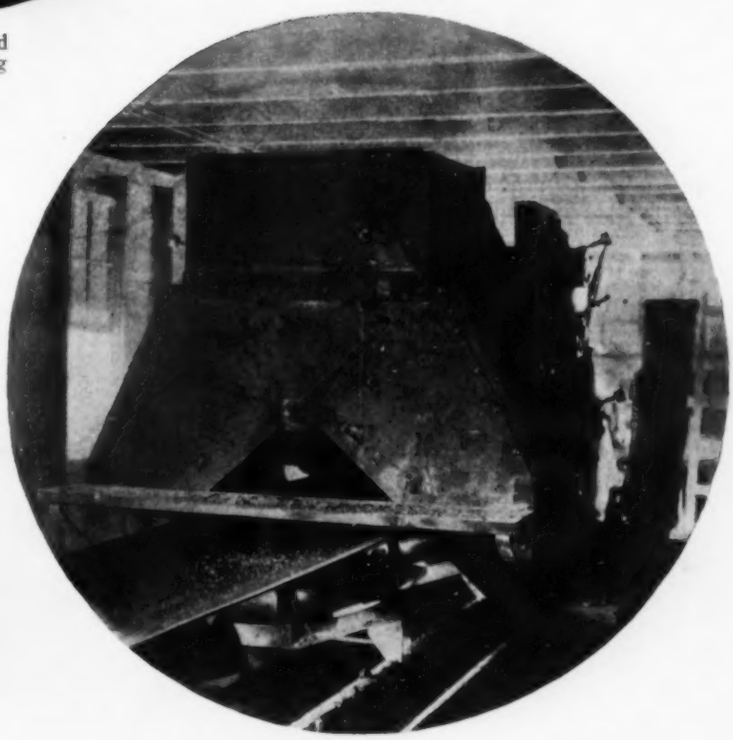
MATERIAL BINS AND CONVEYOR at Arundel plant at east end. Alternate block and opening method of constructing spillway section shown at left.

POSTS OF CONSTRUCTION TRESTLE were placed behind blocks of dam to keep them out of path of flowing water.

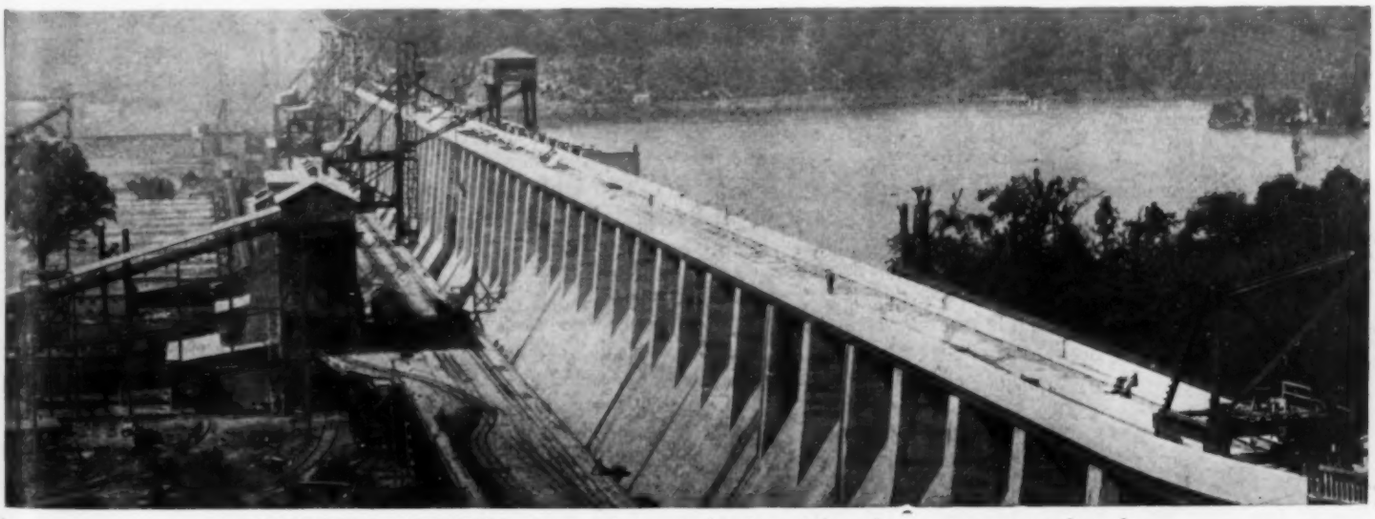
The irregular surface of the rock bottom of the river made special efforts necessary to obtain watertight cofferdams. Soundings were taken from a raft and the bottoms of the cribs were built to conform to the contours of the river bed. Sheeting was pulled after it had been driven once and was scribed to fit the rock surface before being driven the second time. All the cribs were built of 10x12-in. timbers and were 16 ft. wide. They contained about 12,000,000 ft., b.m., of lumber.

The spillway and east abutment area was first divided into two sections for cofferdam construction. In May

DERRICK and steel tower were mounted on each traveler. Hopper on flat car discharged into tower hoppers.



TRIP on Link-Belt conveyor system above the aggregate bins of the east-side mixing plant moved in either direction discharging from either spout.



COMPLETED PORTION of east abutment showing mixing plant, arrangement of tracks for flat cars and traveling gantries on construction trestle.

and June, 1926, the power-house cofferdam was built at the west bank, and the first dam cofferdam extended from the east bank to within 600 ft. of the power house cofferdam. In the fall the dam cofferdam was partially removed to allow water to pass through the openings in the completed section of the dam and thus keep the power-house cofferdam from being topped by the winter and spring floods. In the low water of the spring, 1927, the second section of the spillway cofferdam was constructed, of the same type as the first, to connect with the power-house cofferdam.

Rock Excavation—One of the outstanding accomplishments of the job was the excavation, in six months, of 100,000 cu.yd. of rock inside the power-house cofferdam. Upon completion of excavation in the power-house cofferdam, tailrace excavation was continued in a supplementary cofferdam downstream, a total of 282,000 cu.yd. being removed. The excavating equipment consisted of a battery of Ingersoll-Rand tripod drills, a 3½-yd. Marion, a 2½-yd. Bucyrus, and a number of Marion No. 21 power shovels; all shovels were crawler-mounted.

To handle forms and material for the intake section, of mass concrete with considerable reinforcing around the gate openings, five 15-ton capacity American guy derricks with 100-ft. booms were erected on structural steel towers 38 ft. high. As the construction of the intake section went on the towers were buried in the concrete.

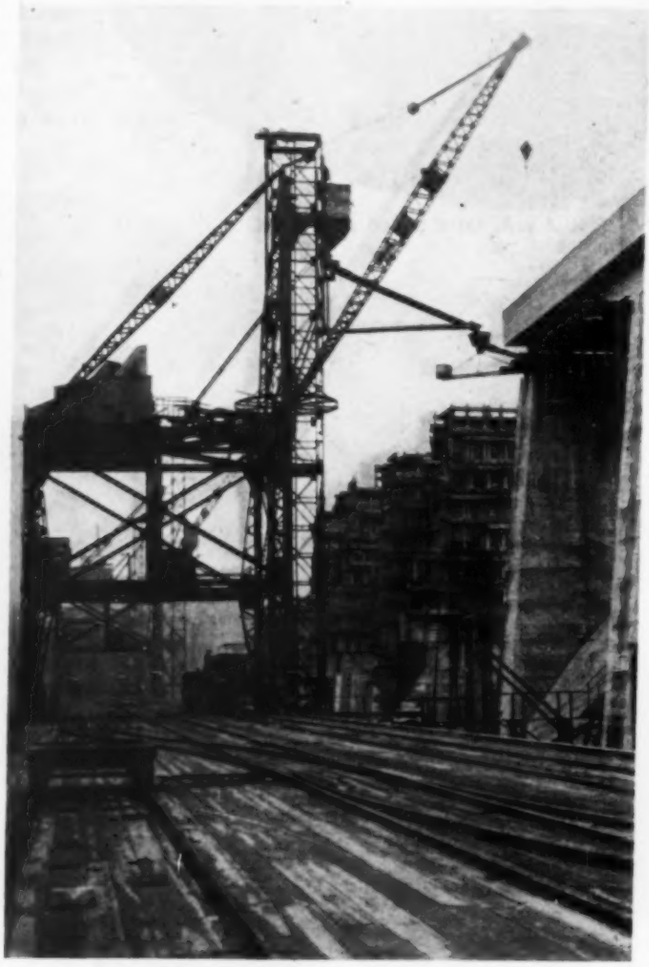
Mixing Plants—The mixing plants on the two sides of the river differed mainly in size. Both were electrically operated and were equipped with Blaw-Knox batchers, inundators, and weigh-scales for handling bulk cement. The plant on the west side, which mixed 216,000 cu.yd. for the power-house and headworks, had two 2-yd. Smith mixers. Running two shifts, this plant in one week produced 12,190 cu.yd.

All the concrete in the power-house section was distributed from four wood towers, 225 ft. high, equipped with Ransome 14-in. counter-weighted chutes. Easton 2-yd. dump cars of the roll-over type were used to haul the concrete from the mixers to the towers.

On the east side, where 435,000 cu.yd. of concrete was placed in the dam, the mixing plant was equipped with four 2-yd. Smith mixers.

The maximum 24-hour pour of concrete was 3,268 cu.yd., and the maximum month's pour, 55,500 cu.yd.

Construction Trestle—A structural steel trestle on the downstream side of the dam was an important feature of the layout on the Arundel Corporation's section. This bridge carried three standard-gage tracks in addition to rails for three traveling gantry cranes.



TRAVELING GANTRY, showing position of steel tower for concrete, derrick, and standard-gage track for flat cars which distributed concrete. Switching facilities were excellent.

The spillway section was built in twenty-six 52-ft. blocks, each including two piers for support of highway bridge and crest gate guides, and twenty-seven 38-ft. sections. The construction bridge piers were spaced on 45-ft. centers. The up and down stream position of the bridge was so fixed that the girders would clear the upper nappe of a 400,000 sec.-ft. flood coming through the openings at any time during the process of making the final closure.

Final Closure of Dam—In making the final closure twenty of the 38-ft. openings were used, and a system of filling up the gaps was devised so that at no stage of the process would there be a high head of water passing through any one opening. Previous to the breaching of the cofferdam, half the openings had been built to El. 22 and half to El. 25. When ready for the final closure the eleven lower openings were closed with stop logs and were built up to El. 30. Then the other eleven were closed and were raised to El. 35. From this point on the openings were built up in successive 10-ft. lifts, with the difference in elevation never greater than 5 ft.

Gantry Crane Equipment—An American stiff-leg derrick and an Insley steel concreting tower were mounted on each of the three traveling gantries. The combination was capable of handling nearly all materials used in the construction of the dam. Attaching the towers to the travelers proved a great advantage, because of their mobility. Concrete was transported from the mixers to the towers in 2-yd. floor hoppers hauled on flat cars by 7-ton gasoline locomotives.

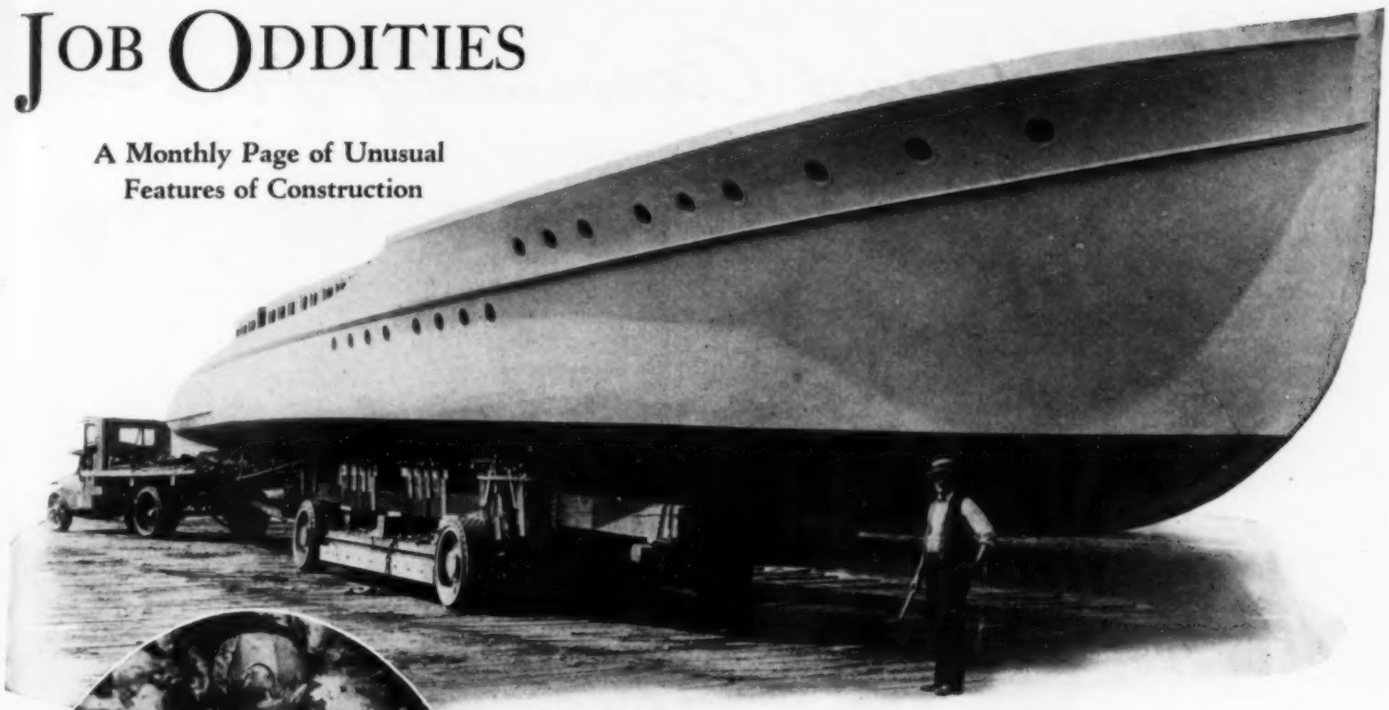
Traveling Derrick—The traveling derrick for erecting structural steel in the power station made quick work of its assignment. This machine erected 4,800 tons of steel in 53 calendar days at remarkably low cost. The 20-ton 100-ft. boom on the south side of the traveler placed the steel in the power-house roof and walls while the 80-ft. boom on the north side set the steel in the electrical bay.

In August, 1927, when construction was at its peak, 3,725 men were employed on the dam and power house. Of this number 2,883 were housed in two well-equipped camps at the site, 837 on the east side and 2,046 on the west side.

COMING: A picture story of the extensive rock tunneling and quarrying operations by Foley Bros., Inc., contractors, in preparing the west approach and anchorages for the great $75,000,000 Hudson River Bridge, now under construction between Fort Washington, N. Y., and Fort Lee, N. J. Here is an outstanding job involving 200,000 cu.yd. of rock excavation, full of ingenious construction "kinks."

JOB ODDITIES

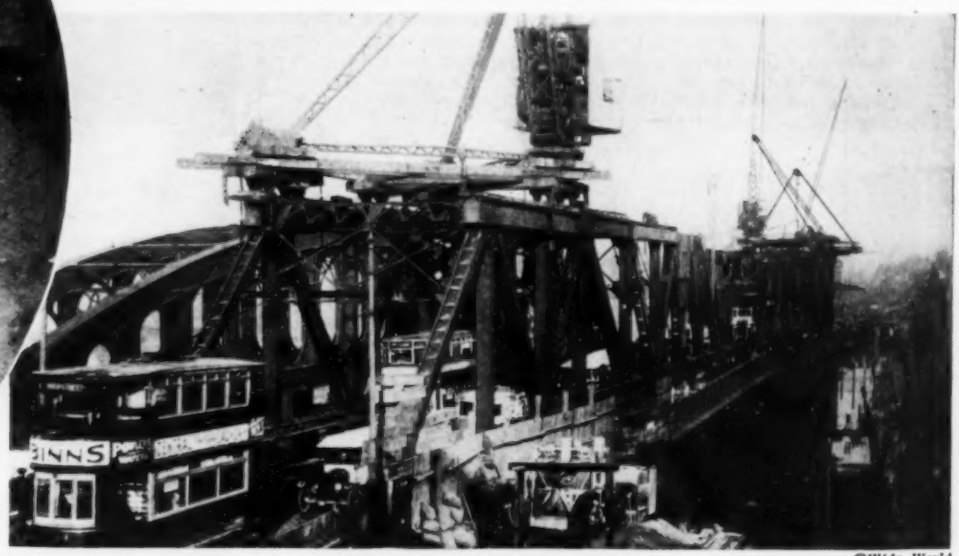
A Monthly Page of Unusual Features of Construction



HUSKY AND VERSATILE! Here's a 35-ton, eight-wheel Highway trailer, designed for moving steam shovels, concrete mixers and other bulky loads, making easy work of carrying a 70-ton launch to the shore of Lake Erie.

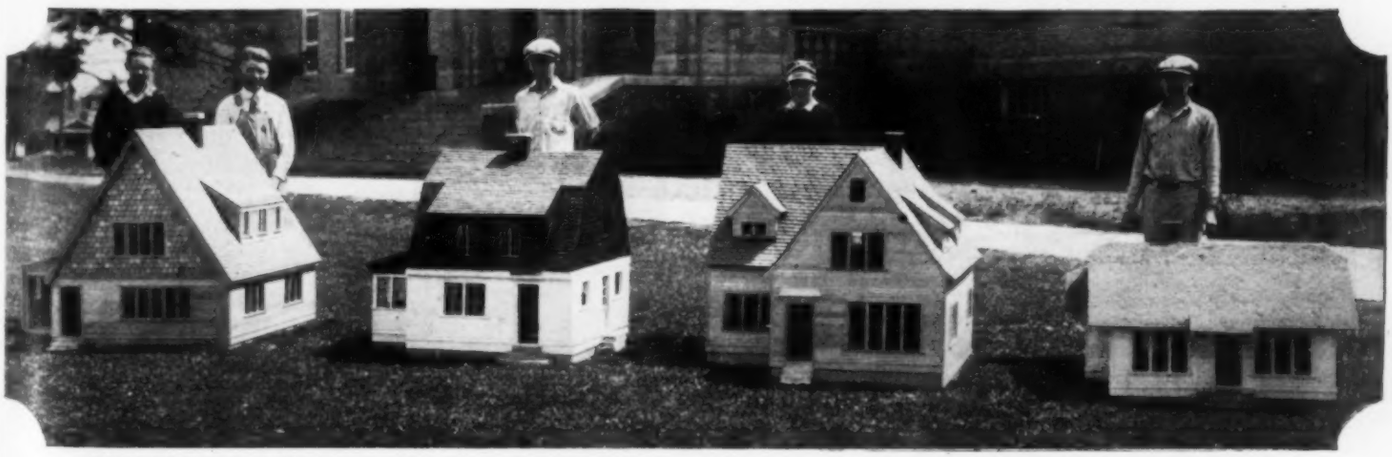
©International

GAS MASKS FOR SUBWAY WORKERS! Right in New York this wartime headgear protects workers from fumes during relocation of gas mains along new subway "trenches."



©Wide World

A BRIDGE ON A BRIDGE. Steel truss above old arch carries traveling derricks which handle steel erection for new Monkwearmouth bridge at Sunderland, England.



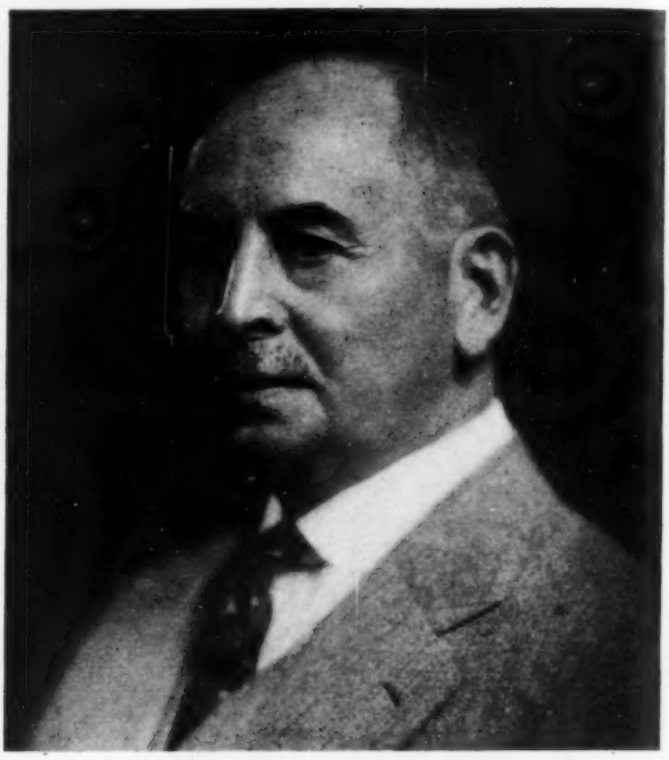
CORRECT TO SMALLEST DETAIL are these model houses which won cash prizes offered to Bend, Ore., manual training students by the Hoo Hoo Club, a lumbermen's organization, the Brooks-Scanlon Lumber Co., and the Shevlin-Hixon Co.

Present and Accounted For —

A Page of Personalities

Uses Plane to Cover Contracts

GEORGE E. JOHNSON, manager of the Economical Bridge Association, of Lincoln, Neb. and Topeka, Kan., finds an airplane "as practical as an automobile" for covering construction jobs involving trips of 100 miles or more. He has traveled by air more than 60,000 miles to date. Mr. Johnson will give further details of his flying experience in *Construction Methods* next month.



Member of World Bridge Congress

LINCOLN BUSH, president of the American Society of Civil Engineers, has been selected as the American member of the Committee on Arrangements for the Second International Congress on Bridge and Structural Engineering to be held in Vienna, Austria, beginning Sept. 24.

Has Big Cuban Road Contract

HENRY J. KAISER, experienced road-builder and president of the Kaiser Paving Co., Oakland, Calif., is directing operations on a big mileage of Cuba's $75,000,000 Central Highway project.

©Harris & Ewing

Heads City Officials Division

CAPT. H. C. WHITEHURST, assistant to the Engineer Commissioner of the District of Columbia, has been elected president of the City Officials Division of the American Road Builders' Association.

LAYING PIPE
in Water-Bearing Sand

PRECAST PIPE SECTIONS, 96 to 108 in. in diameter, were handled by traveler moving on rails along top of trench drained by well points.

RAPID progress under difficult soil and water conditions was made possible by special equipment and methods in constructing a large precast concrete pipe sewer at Hammond, Ind. The soil was dune sand, and ground water was encountered 15 in. below the surface. To remove the water a 4-in. cast-iron pipe line was installed on each side of the trench with valves 20 ft. apart. At 4-ft. intervals were located double hose connections attached to 16-ft. lengths of 2-in. steel pipe with well points driven 2 ft. apart outside the sheeting. Ground water was removed through this system by triplex pumps, operated day and night.

With the sand thus drained of ground water, satisfactory working conditions were provided. The pipe sections, as supplied by the Independent Concrete Pipe Company, were 96 to 108 in. in diameter and were handled by a crane. Average runs of from 60 to 80 ft. were laid under cold weather conditions.

The trench was backfilled immediately after the pipe was installed, but the pumping system was kept running for 24 hours after jointing the pipe.

TRENCH for smaller sewer line was excavated with pull shovel and backfilled as soon as pipe joints were made. Ground water was lowered by well-point and pumping system.

NEW EQUIPMENT ON THE JOB

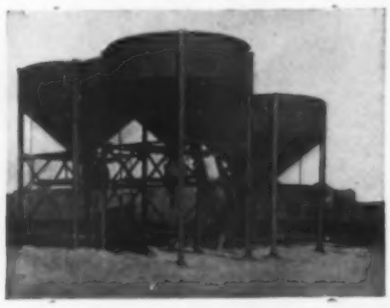
New Wear-Proof Pump

A portable centrifugal pumping unit, with manganese steel shell, impeller and discs to reduce wear, is a new development of the American Manganese

Steel Co., Chicago Heights, Ill. These units are made with 2, 2½ and 3-in. discharges. The first two sizes have capacities of 100 and 150 gal. per minute against a 34-ft. lift. The 3-in. size will discharge 230 gal. per minute against a 37-ft. lift.

Bins with Sturdy Columns

Hetherington & Berner, Inc., of Indianapolis, have brought out a line of elevated steel storage bins with diameters ranging from 12 to 22 ft.



and capacities, when level full, of 30 to 200 cu.yd. The bins are supported by sturdy 8-in. H-section columns which extend to the tops of the bins, or above, if a framework for any needed superstructure is desired. Each bin has a conical hopper with a slope that guarantees self-cleaning.

Midget Air Hammer

The Union Iron Works of Hoboken, N. J., has introduced the Union Midget air hammer, shown in the photograph below. This hammer was designed primarily to drive 2 and 3-in. wood sheeting. It weighs 97 lb., has striking parts weighing 24½ lb. and delivers

more than 550 blows of 275 ft.-lb. energy per minute. The hammer uses 32 cu.ft. of air per minute at a pressure of 90 lb.

Two New Clay Diggers

Two new Thor pneumatic clay diggers of the valveless type have been developed by the Independent Pneumatic Tool Company, Chicago. One, for soft clay digging, has a speed of 2,800 blows per minute and weighs

24¾ lb. The other, with a speed of 2,200 blows per minute, is suitable for hard digging; it weighs 25¾ lb.

Light Revolving Crane

An "automotive" crane, a full-revolving, ball-bearing unit for either truck or stationary mounting, has been placed

on the market by the Ersted Manufacturing Co. of Portland, Ore. The rotating frame, base frame and 25-ft. boom are of structural steel electrically welded throughout. The machine is provided with a double-drum, three-speed gasoline hoist which may be used either on the crane, or separately, for all ordinary hoisting operations. Hoisting capacity is 2½ tons in low gear.

Roller with Water Drum

A roller, smaller and lighter than the 3-ton type and yet heavier than a hand roller, has been designed by the Pierce

Governor Co., Anderson, Ind. Its weight can be varied from 1½ to 2 tons. The rear roller is a steel drum which can be filled with water to increase its weight. The machine can work in close quarters.

McGRAW-HILL PUBLISHING COMPANY, INC., Tenth Ave. at 36th St., New York, N. Y.

JAMES H. McGRAW, President
JAMES H. McGRAW, Jr., Vice-Pres. and Treas.
MALCOLM MUIR, Vice-President
EDWARD J. MEHREN, Vice-President
MASON BRITTON, Vice-President
EDGAR KOBAK, Vice-President
C. H. THOMPSON, Secretary

NEW YORK District Office, 285 Madison Ave.
WASHINGTON, Colorado Building
CHICAGO, 7 S. Dearborn Street
PHILADELPHIA, 1600 Arch St.
CLEVELAND, Guardian Building
ST. LOUIS, Bell Telephone Building
SAN FRANCISCO, 883 Mission Street
LONDON, 6 Bouverie St., London, E. C. 4

Cable Address: "Machinist, N. Y."

Publishers of

Engineering News-Record — **American Machinist**
Power — **Chemical and Metallurgical Engineering**
Coal Age — **Engineering and Mining Journal**
Radio Retailing — **Ingeniería Internacional**
Bus Transportation — **Electric Railway Journal**
Electrical World — **Electrical Merchandising**
Construction Methods
Electrical West
(Published in San Francisco)
American Machinist—European Edition
(Published in London)

Subscription is two years for $1 to the United States, Canada, Mexico, Alaska, Hawaii, the Philippines, Porto Rico, Canal Zone, Cuba, Honduras, Nicaragua, Peru, Colombia, Bolivia, Chile, Dominican Republic, Panama, El Salvador, Argentina, Brazil, Spain, Uruguay, Costa Rica, Ecuador, Guatemala, Haiti and Paraguay. Extra postage to other countries, $1 (total $2 or 9s. 4d.) for two years. Single copy, 5 cents.

Change of Address—When change of address is ordered the new and the old address must be given. Printed in U. S. A.

Copyright, 1928, by McGraw-Hill Publishing Company, Inc.

Published monthly.

Piling up the Proof

THERE can be but one reason for the ever increasing sales of Thew Shovels, Cranes, Draglines and Back-diggers—the users are satisfied and are making money.

In spite of last year's tremendous sales increase, the first half of 1928 shows a large increase in total sales over last year.

April 1928 sales were the largest in 33 years!
May 1928 sales were the largest in 33 years!
June 1928 sales were the largest in 33 years!

AND

"Lorain 75" sales for the first six months of 1928 showed a 62% increase over 1927, which set the previous high record.

Once again we ask—What greater proof of user's *profit* and *satisfaction* can be given?

THE THEW SHOVEL CO.
LORAIN, OHIO

THEW

LORAIN 60 AND 75

Shovels, Cranes, Draglines and Back-diggers

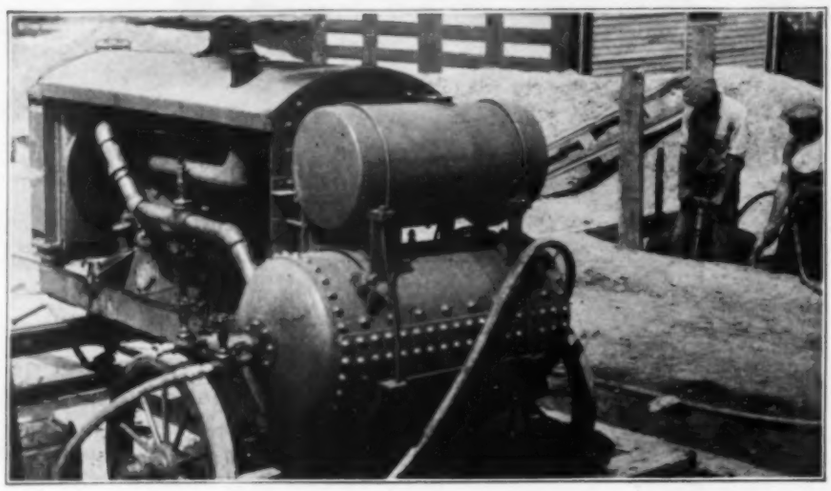
Gasoline, Steam and Electric Powered

THEW CENTER DRIVE

60% INCREASE IN SALES!
INCREASE in Thew sales is proof of users profit. That Thew Center-Drive Shovels, Draglines and Clamshells are today outstanding leaders is proved by a sales increase of 60% for the first four months of 1927 over same period for 1926 ··· and an increase of 40% over any four month period in the entire 32 years Thew has been making Power Shovels and Cranes.
THE THEW SHOVEL COMPANY
T H E W

Above Advertisement Nation's Business—July, 1927

It's the *Super-Charger* of the *Thor* SIX AIR COMPRESSOR *That Gives You 26% More Air*



THOR Clay Digger. Valveless type. No vibration, resulting in easier handling. Freezing has been eliminated. Made in two sizes: No. 201, a speedy digger for lighter work and No. 202, a powerful digger for very heavy work.

THOR Paving Breaker. The re-coil or "kick-back" has been eliminated and the full effect of the blow is directed downward on the work. Does not freeze in severe weather. New steel retainer prevents steel from dropping out of the nozzle. Made in two types: No. 241, a light, speedy gun and No. 240, a powerful, hard-hitting breaker.

Here's Why the THOR SIX Has A Super-Charger

No compressor ever delivers an amount of free air equal to its displacement. The actual delivery of air ranges from 60 to 65% of the capacity or rating. This is due to clearance loss, valve slippage, excess tension of springs, piston leakage, humidity, etc.

AND THAT IS WHY THE THOR SIX COMPRESSOR HAS A SUPER-CHARGER

The Rix Super-Charger counter-acts these various losses to the extent that it makes the THOR about 83% efficient. The THOR is rated at 116 cu.ft. and actually delivers 96 cu.ft. of it. In other words, it takes a compressor of much larger capacity to equal the THOR in air delivery.

The Rix Super-Charger is an exclusive, patented feature that enables the piston on its idle or downward stroke to compress the additional air the THOR delivers.

Another important feature is the unit-type construction of the THOR. Both engine and compressor are mounted on a common crank case, eliminating gears, clutches and couplings. The advantages of this "direct-connected" design are tremendous, and it is responsible for the very low upkeep cost of a THOR.

Let us give you complete details about this modern, efficient compressor. It will cost you nothing but a few minutes of your time and the saving involved is well worth it. Write for Bulletin 103.

INDEPENDENT PNEUMATIC TOOL CO.

PNEUMATIC TOOLS

GENERAL OFFICES
600 W. Jackson Blvd.
CHICAGO

ELECTRIC TOOLS

FACTORY AURORA, ILL.

BRANCHES THE WORLD OVER

Eastern Office 1463 Broadway, New York

London Office 40 Broadway, Westminster, London

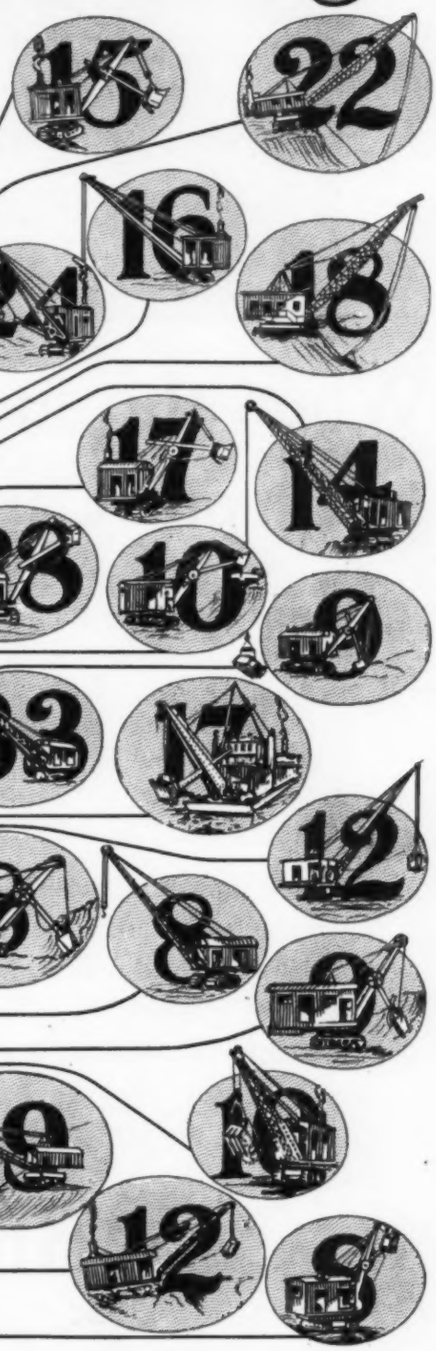
Yes, repeat sales do mean something!

After you have made comparisons and have picked a BUCYRUS-ERIE, it is certainly a satisfaction to see that your judgment is backed up by the experience of so many other substantial contractors.

Here are a few of the well-known concerns that you can see on the world's longest list of shovel, dragline and crane buyers. Companies like these have kept on buying BUCYRUS-ERIES, year after year, because of the Bigger Outputs obtained, and unequalled Reliability.

	Number of BUCYRUS-ERIES
S. J. GROVES & SONS CO., Minneapolis, Minn.	15
WALSH CONSTRUCTION CO., Davenport, Iowa	22
LANE CONSTRUCTION CO., Meriden, Conn.	24
JOHN F. CASEY CO., Pittsburgh, Pa.	16
FOLEY BROTHERS, St. Paul, Minn.	18
JOHN PHILLIPS, San Francisco, Calif.	14
DWIGHT P. ROBINSON & CO. Inc., New York City	17
JOHN MARSH, Inc., Chicago, Ill.	28
C. W. BLAKESLEE & SONS, New Haven, Conn.	10
L. E. MYERS CO., Chicago, Ill.	9
WINSTON & CO., Kingston, New York	33
GREAT LAKES DREDGE & DOCK CO., Chicago, Ill.	17
MORRISON-KNUDSEN CO., Boise, Idaho	12
H. W. NELSON, Chicago, Ill.	8
ANDREWS ASPHALT PAVING CO., Hamilton, Ohio	8
HAUSER CONSTRUCTION CO., Long Beach, Calif.	9
McCRADY BROS. CO., Braddock, Pa.	10
THE FOUNDATION CO., Chicago, Ill.	19
PATRICK McGOVERN, Philadelphia, Pa.	12
WM. C. HORN CO., Galeton, Pa.	8

—and many more firms of the same calibre have consistently bought BUCYRUS-ERIES, year in and year out.



Write and tell us the kind of work you have, and we'll send you some performance records made by BUCYRUS-ERIES on similar work. *These records show why so many owners keep buying more and more BUCYRUS-ERIES.*

BUCYRUS-ERIE COMPANY

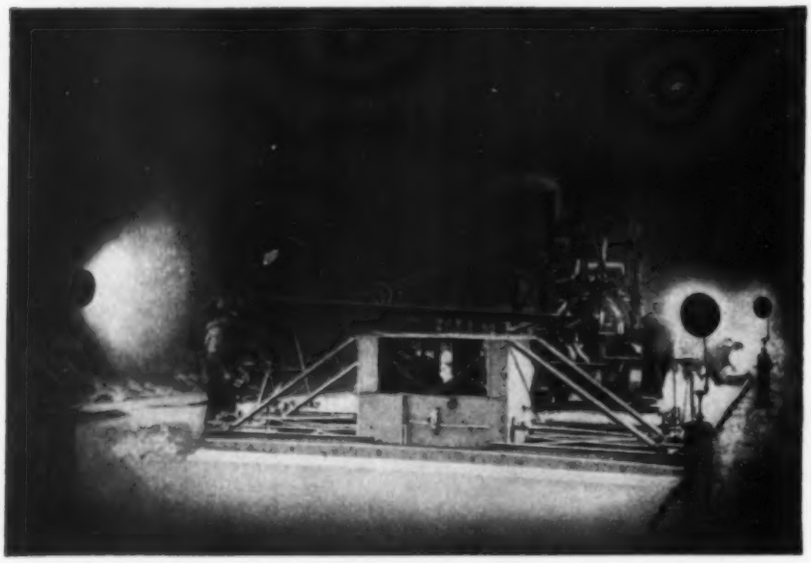
Plants: South Milwaukee, Wis.; Erie, Pa.; Evansville, Ind.
General Sales Offices: South Milwaukee, Wis., and Erie, Pa.

Boston
New York
Philadelphia
Atlanta
Birmingham
Pittsburgh

BUCYRUS ERIE

Buffalo
Detroit
Chicago
St. Louis
Dallas
San Francisco

Representatives throughout the U. S. A. and Canada
Offices and agencies in all the principal countries throughtout the world.



Style No. 2

This popular light weighs only 115 pounds charged. One full charge burns for twelve hours.

When the sun goes down put Carbic light to work

THE days are getting shorter. Frost and cold weather will soon be here. Now is the time to speed up your job by working at night with Carbic light.

Carbic light makes night work productive. It is steady and powerful. Twenty-five to thirty men can work under one Carbic Flood Light. It does not glare and it never weakens.

The light itself is simple. There are only three parts. Any inexperienced laborer can charge it in a few minutes. It is a self-contained unit and can be easily carried from place to place. Fourteen years of extensive use by leading contractors have proved its long life and low cost of operation.

Your jobber can supply you.

CARBIC LIGHT

OXWELD ACETYLENE COMPANY

Unit of Union Carbide and Carbon Corporation

New York City, 30 East 42d Street — Chicago, Peoples Gas Bldg.

San Francisco, Adam Grant Bldg.

Carbic is distributed by the Union Carbide Sales Company through its national chain of warehouses and is sold by jobbers everywhere.

You can't beat this 1/2 yd. machine

"Feather-touch" control—there *is* no other power clutch control like it. It means 25% greater capacity.

Cast steel bases—no rivets to snap out, no channels to loosen—a firm foundation that easily carries the rotating load.

Positive traction—no other ½ or ¾ cu. yd. shovel can offer you this time-saving money-making mobility feature!

Ball bearings—carry all high speed shafts and assure the delivery of all the engine power—nothing haywire about this half yard.

Convertibility—a shovel, crane, dragline, skimmer scoop or pull-shovel in a few hours' time. Simply change booms, no drums to put in, no crowding chains to disconnect.

Cable crowd—no division of engine power between hoist and crowd—the easiest grading shovel you ever handled.

and many more

NORTHWEST features mean SPEED

CM9-Gray

NORTHWEST ENGINEERING CO.
Steger Bldg., 28 E. Jackson Blvd., Chicago
Gentlemen: Please send your catalog describing the above featu

Name

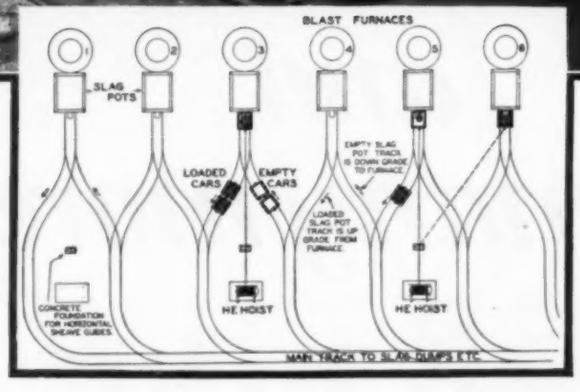
Address

Town

$1040 Earns $1000 Monthly

THE OLD AND THE NEW

At right is shown the Sullivan Hoist pulling a slag car up the grade; beside it is the discarded locomotive. Below is a diagram showing the location of the hoists, and the method of operation.


BLAST FURNACES
SLAG POTS
LOADED CARS
EMPTY CARS
EMPTY SLAG POT TRACK IS DOWN GRADE TO FURNACE
LOADED SLAG POT TRACK IS UP GRADE FROM FURNACE
CONCRETE FOUNDATION FOR HORIZONTAL SHEAVE GUIDES
H.E. HOIST
H.E. HOIST
MAIN TRACK TO SLAG DUMPS ETC.

Sullivan Hoists
Smash Car-Pulling Costs

A Utah Smelter was keeping two locomotives and crews busy handling slag cars.

One outfit collected the cars from the furnaces, and the other hauled trains to the dump.

Then somebody suggested Sullivan Hoists for the collecting job. Two 480-lb. electric units were installed. Each was placed to handle cars from two of the four furnaces in operation, as the diagram shows.

The hoists hauled the 5-ton cars easily up the 2½% grade to the collecting point. Each unit handles 50 to 60 cars per shift, and works about one-fourth the time.

One engine and crew was taken off, with a resulting saving of $1,000.00 monthly.

This installation is only another instance where the compact little Sullivan Hoist is making big money for its owners. Many other applications of both the Turbinair and Electric units, are well known to construction men. Single and two-drum hoists, and numerous sizes, are available.

Send today for the Catalogs, 7276-F, 7276-G, 7276-H.

SULLIVAN TRADE MARK

Boston · New York · Cleveland · Pittsburgh · St. Louis · Knoxville · Birmingham

SULLIVAN MACHINERY COMPANY
168 SOUTH MICHIGAN AVE., CHICAGO

Dallas · Duluth · Denver · Spokane · El Paso · San Francisco · Salt Lake City

"HERCULES"
RED-STRAND
REG. U.S. PAT. OFF.
WIRE ROPE
Here are two more big jobs on which "HERCULES" (Red-Strand) Wire Rope was the chief burden bearer. The building under construction is St. Louis' new $4,000,000 Court House. At the left is the recently completed Southwestern Bell Telephone Building.
Contractors on Court House
Substructure:—Fruin-Colnon Contracting Co., St. Louis.
Steel:—St. Louis Steel Erection Co., St. Louis.
Stone:—The Steven & Son Co., Chicago and St. Louis.
Concrete:—A. D. Gates Construction Co., St. Louis.
Metal Window Frames:—Lasar Mfg. Co., St. Louis.
Established 1857
A. Leschen & Sons Rope Co.
5909 Kennerly Ave., St. Louis, Mo.
New York Chicago Denver San Francisco
THE CIVIL COURT HOUSE
TO FACE THE MEMORIAL PLAZA

Ransome

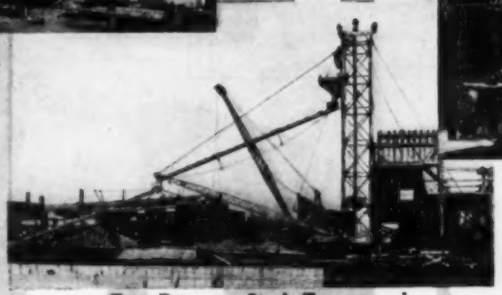
Ransome Steel Towers and Ransome Standard Building Mixers were used on the Central Railroad Station, Milan, Italy.

Ransome Steel [illegible] Equipment and a Ransome Mixer used on the Bluewater Dam, Texas.

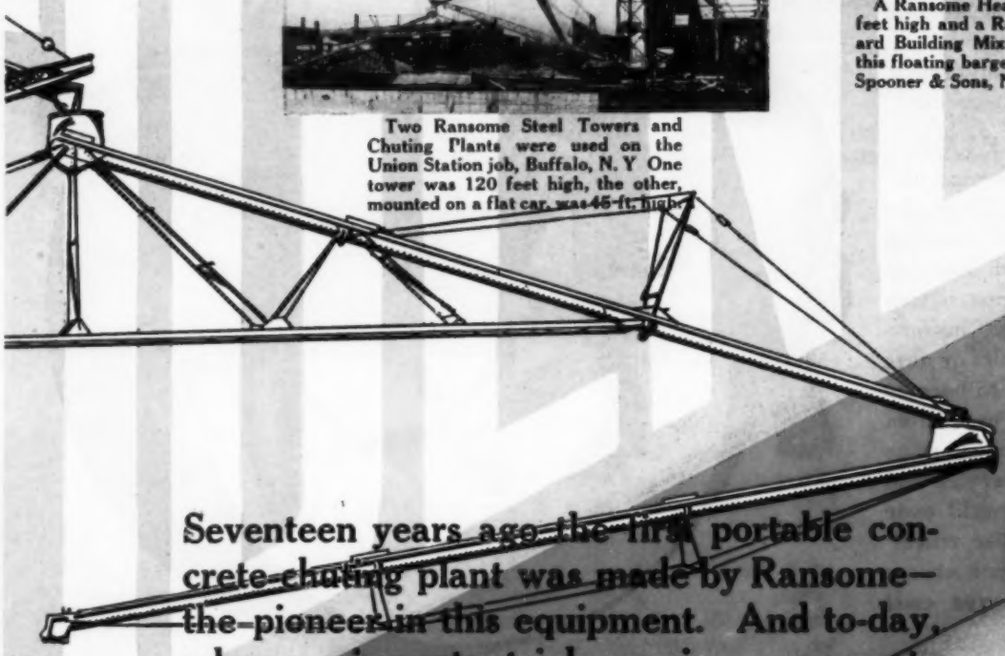
CHUTING PLANTS

Two of the Steel Towers were 255 feet high; four 180 feet high. One 21-S Ransome Standard Building Mixer and two 28-S Ransome Standard Building Mixers were used.

A Ransome Heavy Steel Tower, 75 feet high and a Ransome 28-S Standard Building Mixer are mounted on this floating barge owned by Allen N. Spooner & Sons, New York City.



Two Ransome Steel Towers and Chuting Plants were used on the Union Station job, Buffalo, N. Y. One tower was 120 feet high, the other, mounted on a flat car, was 45-ft. high.



Seventeen years ago the first portable concrete-chuting plant was made by Ransome—the-pioneer-in this equipment. And to-day, when an important job requires a concrete chuting plant erected in the regular way—or on a flat car—or on a barge—you will find many of the leading contractors in this country and abroad are placing their confidence in Ransome.

RANSOME
AMERICA'S FIRST MIXER

Ransome Concrete Machinery Company

1850—Service for 78 Years—1928

Dunellen New Jersey

ACCEPT NO SUBSTITUTE

Sterling

scientifically designed bracing and riveted frame gives greatest strength and rigidity.

There should be more to a wheelbarrow than simply a tray, with a wheel, two legs and a couple of sticks hitched on. More than just any old perambulator built to sell cheap. There should be more—*and there is more*—you will find it only in a Sterling. Compare its construction.

Properly balanced barrows *carry the load over the wheel.* Therefore the greatest stress and weaving is at the front. Ordinary braces of flat stock or even angle iron were found not strong enough to meet Sterlings requirement. Sterling designed, scientifically, special "V-formed" front braces.

The same special engineering design is carried through in the assembly of the channel steel leg which is securely riveted. Because of this sturdy leg construction Sterling barrows never become shaky. There are no bolts or nuts to loosen, to tighten or to become lost. These two features, shown here will make you three times as much money in longer service and less repairs than you could ever save by buying any other wheelbarrow. Why take a chance, others don't. — *Sterlings always cost less per job to use.*

Buy by Sterling name — leading hardware and equipment dealers have them or they can get them quickly from our complete stock warehouses at Chicago, New York, Philadelphia, Pittsburgh, Cleveland, Detroit, St. Louis.

SPECIAL STERLING FEATURES

Self-lubricating bearings
10-spoke wheel
Malleable iron brackets
Smooth wheel face
Wrought steel hub
Riveted and cast to hub spokes
Fixed rolled steel axle
"V" front tray braces
Selected maple handles
Special tubular steel handles
Handles clamped — not bolted
Top of tray reinforced
Channel steel legs
Riveted leg braces
Extra leg shoes
Wrought iron handle tips

All parts interchangeable

STERLING WHEELBARROW COMPANY

STERLING ON A WHEELBARROW MEANS MORE THAN STERLING ON SILVER

Milwaukee — Wisconsin

meets every dirt-moving problem . . .

PROVIDING the greatest draw-bar horse power of any tractor on the market per pound of metal purchased, and offering scores of exclusive advantages in mechanical construction, made possible through the combined resources of Monarch-Allis-Chalmers engineers —

— the Monarch Tractor meets every dirt moving problem. For top maintenance work in road building, for cat wagon hauling, for every grader operation, the Monarch Tractor is without equal because of its matchless power, performance and economy in operation.

The Monarch's unique combination of low weight and great draw-bar pull especially adapts it to the earth-mover's requirements. This has been accomplished both by distributing the weight of the Monarch in such a way that the center of gravity falls well ahead on the tractor, and by using unusually long tracks.

Write for further details!

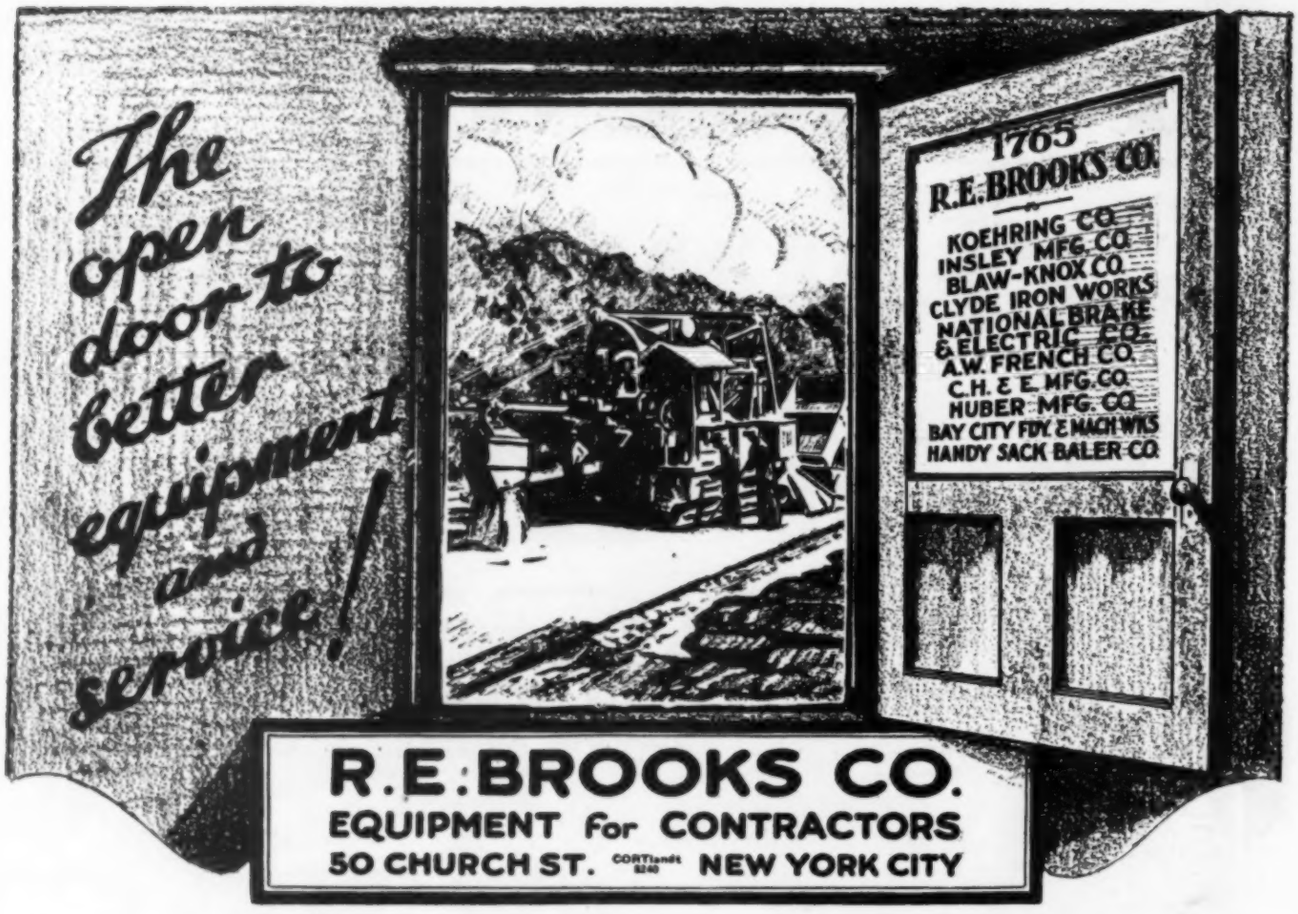
"50" $3625.00

"75" $5350.00

PRICES F. O. B.
Springfield, Illinois

MONARCH TRACTORS CORPORATION
Subsidiary of Allis-Chalmers Mfg. Co.
SPRINGFIELD, ILL.

Monarch Tractors



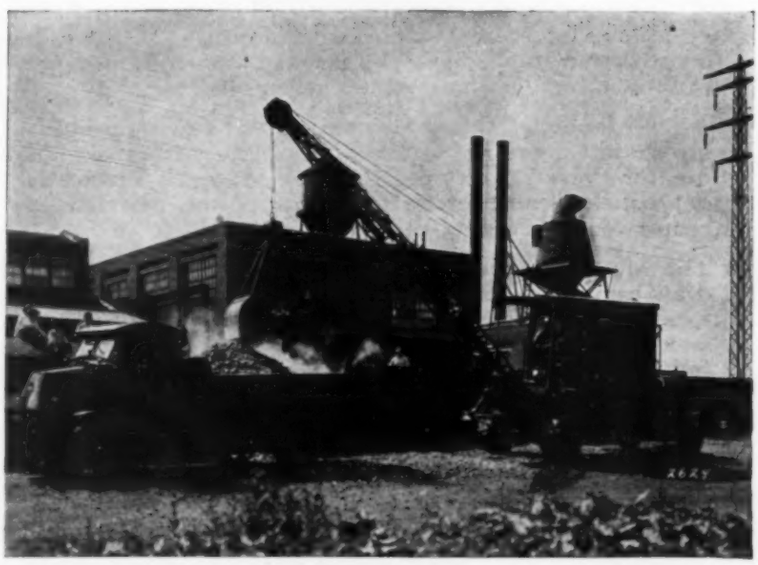
LOCOMOTIVE – TRUCK – CRAWLER CRANES
GAS – STEAM – ELECTRIC

MORE productive work at a lower cost per working hour—that's something you can be *sure* of with a Browning. They are fast and easy to handle; they are economical in operation and upkeep; they will work for you for years.

Let us show you how a Browning Crane can save for you.

THE BROWNING CRANE COMPANY
16226 Waterloo Road
CLEVELAND, OHIO, U. S. A.
New York : Chicago : Pittsburgh : Birmingham

DISTRIBUTORS:
Portland : Los Angeles : Montreal : Toronto
San Francisco : New Orleans : Baltimore : Houston
Jacksonville : Boston



A Browning Truck Crane demonstrating its speed in unloading crushed stone from car to truck.

BROWNING

SPEED!

Plus Dependability!

Plus Economy!

Measured by these three standards "Built Better" Northerns Register 100%

What more do you need to get "Results"?

THE NORTHERN "BUILT BETTER" MATERIAL HANDLING EQUIPMENT

Speed: Simplicity of design insures greater capacity.

Greater capacity results in more material handled per hour.

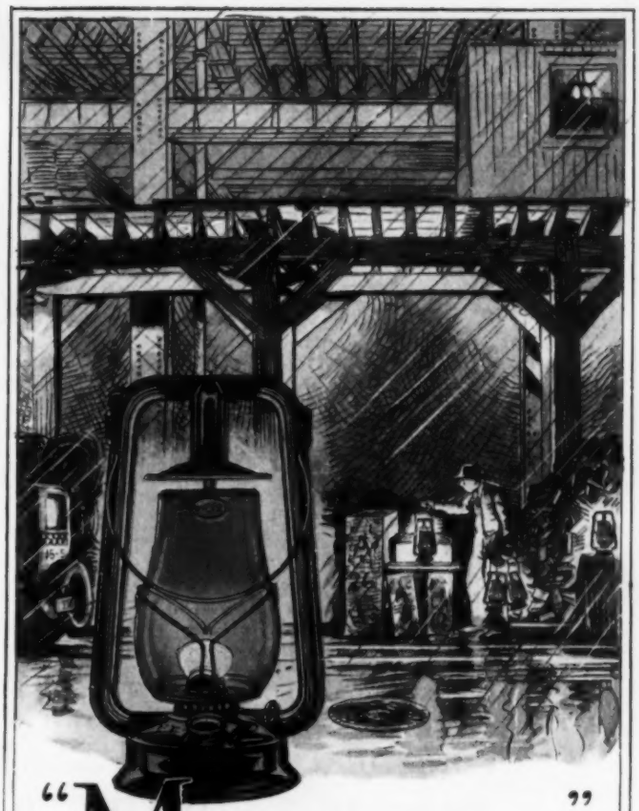
Dependability: Fewer working parts to get out of order.

Guarantees long-wearing trouble-free Service.

Economy: Low maintenance cost. Time saved in operation means money saved.

Write for further information.

Northern Conveyor & Mfg. Co.
Janesville, Wis.



"MONARCH"

of all it surveys

NO "Napping" by Dietz Lanterns! They are built to burn and STAY burning in all kinds of weather — affording utmost protection from accidents and damage claims. Made RIGHT of lasting materials, with Terne Plate bottoms that resist rust.

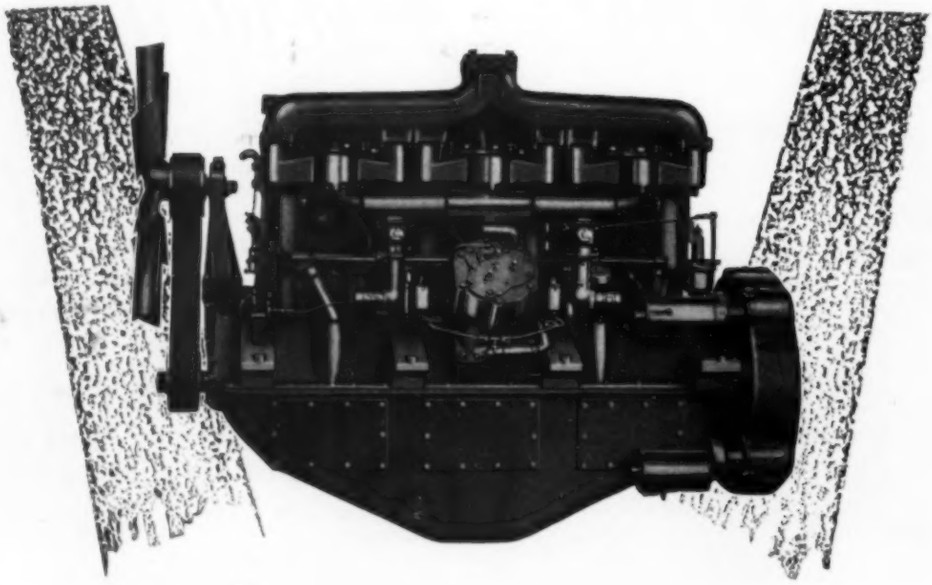
Dietz "MONARCH" is a practical Hot Blast Lantern—good looking—low priced and widely used on construction jobs.

Dietz Lanterns—
for PROTECTION!

R. E. DIETZ COMPANY
NEW YORK
Largest Makers of Lanterns in the World
FOUNDED 1840

DIETZ LANTERNS

Bridging the gap — and how securely. Its very design and massive build is indicative of its DEPENDABILITY. Its structure reflects its strength. Many times its own weight will pass over it with every CONFIDENCE ... In the construction field — Le Roi Power stands for such DEPENDABILITY. It gives year in and out dependable service and stays active longer. Its performance is proof. Look to the Le Roi for DEPENDABLE POWER and know it by what it does.



LE ROI COMPANY, MILWAUKEE, WIS.

LE ROI ENGINES

3 *to* 160 HORSE POWER

1929 Road Show—Cleveland—Week of Jan. 14.

with GENERAL, so called weak points become the strongest

You'll always recognize General Wheelbarrows by their orange handles

GENERAL engineering has taken the supposed weak points of wheelbarrow construction, carried them past the not-very-weak-and-not-very-strong point, and lifted them into actual elements of strength.

At the right are shown three wheelbarrow parts often thought of as most vulnerable. Under General handling, they have become factors of positive endurance and service.

The arrows and figures appearing on one of these illustrations are not accounted for here. You'll find them explained, however, in the new General Wheelbarrow Handbook, together with much other important information. Mail the coupon for your copy today.

A bolt is necessarily smaller than the hole, and so it necessarily works loose. A rivet is driven by pressure, swells to fit the hole, and stays tight. General steel channel legs are riveted, have the most efficient of rear braces, and are fitted with broad, flat wearing shoes riveted *front and back.*

The General 10-spoke wheel is guaranteed. The axle is ¾" diameter, made of high carbon rail steel. It has 17% more wearing surface and is 40% stronger than the usual ⅝" type. Axle is accurately cotter keyed.

General trays are unconditionally guaranteed against opening up or coming apart. Double lapped corners are riveted and welded. Bolt holes are spaced with absolute accuracy. Trays are cut and folded, formed cold.

GENERAL AKRON

GENERAL WHEELBARROW COMPANY

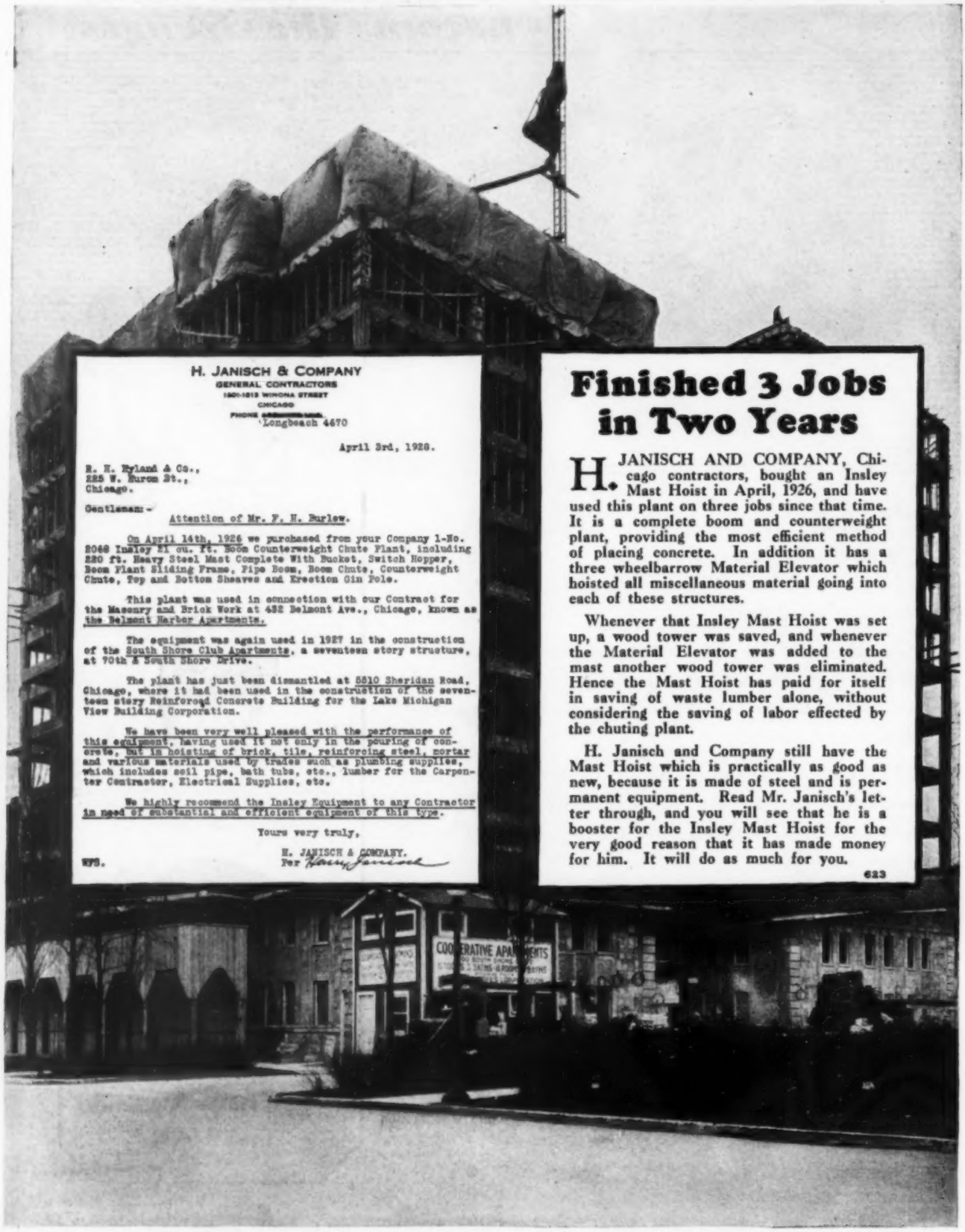
Headquarters for Wheelbarrows, Concrete Carts, Steel Mortar Boxes, Scrapers, Salamanders

3140 East 65th Street Cleveland, Ohio

GENERAL WHEELBARROW COMPANY
3140 East 65th Street Cleveland, Ohio
Our equipment distributor's name and address are

Send us your General Wheelbarrow Handbook.
Name
Company Name
Street Address
City State
CM 9-28

INSLEY MAST HOIST • CONCRETE PLACING MATERIAL HANDLING • EQUIPMENT



H. JANISCH & COMPANY
GENERAL CONTRACTORS
1801-1813 WINONA STREET
CHICAGO
PHONE Longbeach 4670

April 3rd, 1928.

R. H. Hyland & Co.,
225 W. Huron St.,
Chicago.

Gentlemen:-

Attention of Mr. F. H. Burlew.

On April 14th, 1926 we purchased from your Company 1-No. 8068 Insley 21 cu. ft. Boom Counterweight Chute Plant, including 220 ft. Heavy Steel Mast Complete With Bucket, Switch Hopper, Boom Plant Sliding Frame, Pipe Boom, Boom Chute, Counterweight Chute, Top and Bottom Sheaves and Erection Gin Pole.

This plant was used in connection with our Contract for the Masonry and Brick Work at 432 Belmont Ave., Chicago, known as the Belmont Harbor Apartments.

The equipment was again used in 1927 in the construction of the South Shore Club Apartments, a seventeen story structure, at 70th & South Shore Drive.

The plant has just been dismantled at 5610 Sheridan Road, Chicago, where it had been used in the construction of the seventeen story Reinforced Concrete Building for the Lake Michigan View Building Corporation.

We have been very well pleased with the performance of this equipment, having used it not only in the pouring of concrete, but in hoisting of brick, tile, reinforcing steel, mortar and various materials used by trades such as plumbing supplies, which includes soil pipe, bath tubs, etc., lumber for the Carpenter Contractor, Electrical Supplies, etc.

We highly recommend the Insley Equipment to any Contractor in need of substantial and efficient equipment of this type.

Yours very truly,

H. JANISCH & COMPANY.
Per Harry Janisch

WFG.

Finished 3 Jobs in Two Years

H. JANISCH AND COMPANY, Chicago contractors, bought an Insley Mast Hoist in April, 1926, and have used this plant on three jobs since that time. It is a complete boom and counterweight plant, providing the most efficient method of placing concrete. In addition it has a three wheelbarrow Material Elevator which hoisted all miscellaneous material going into each of these structures.

Whenever that Insley Mast Hoist was set up, a wood tower was saved, and whenever the Material Elevator was added to the mast another wood tower was eliminated. Hence the Mast Hoist has paid for itself in saving of waste lumber alone, without considering the saving of labor effected by the chuting plant.

H. Janisch and Company still have the Mast Hoist which is practically as good as new, because it is made of steel and is permanent equipment. Read Mr. Janisch's letter through, and you will see that he is a booster for the Insley Mast Hoist for the very good reason that it has made money for him. It will do as much for you.

623

INSLEY MANUFACTURING COMPANY • Indianapolis

Engineers and Manufacturers

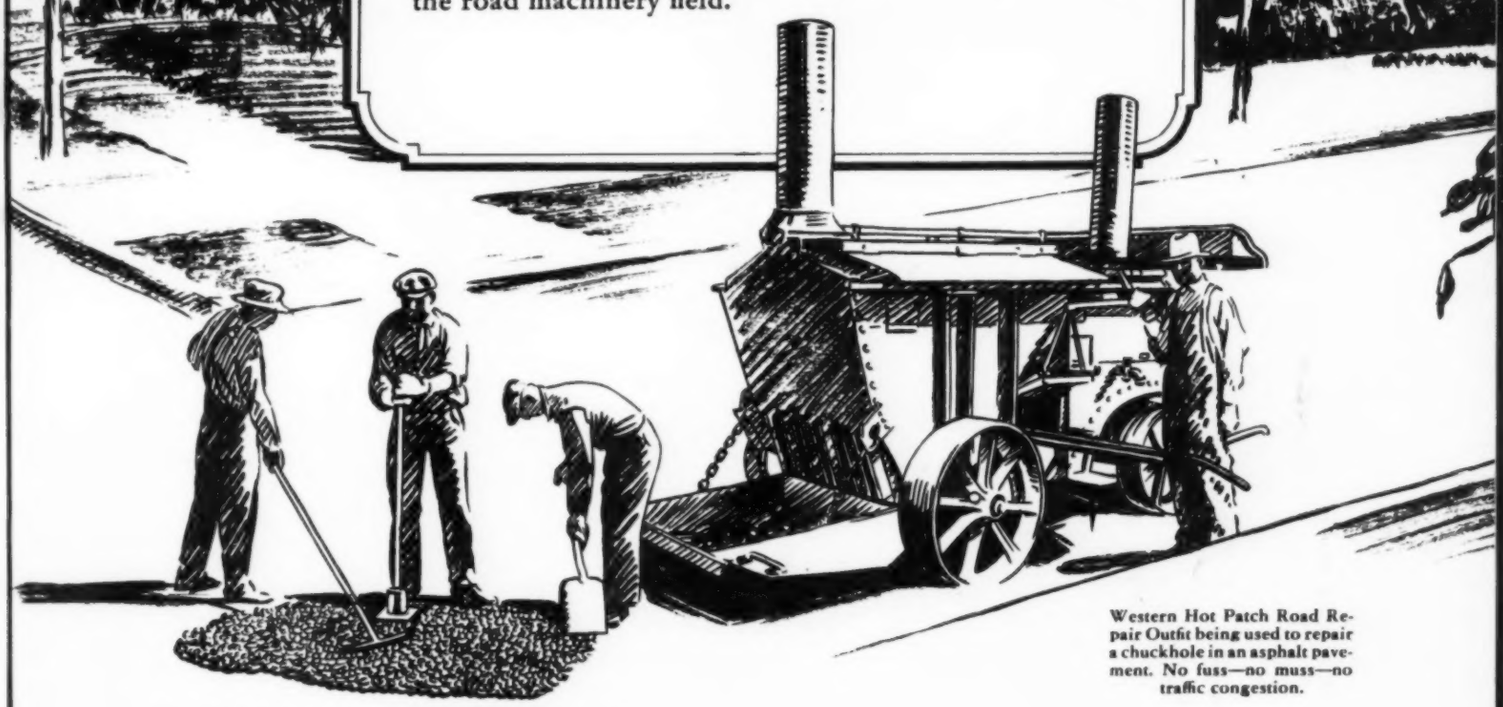
THE AUSTIN-WESTERN LINE

HOT PATCH OUTFIT

Success built on service

An organization can only prosper and achieve greatness in proportion to its real service to the community or nation. In the Austin-Western background of 70 years of providing good machinery for road construction and maintenance, no greater service has been offered to the communities of the nation than prolonging the life of any type of pavement for many years, with the Western Hot Patch Road Repair Outfit.

It is to such services, invaluable alike to public officials and taxpayers, that Austin-Western owes its position in the road machinery field.



Western Hot Patch Road Repair Outfit being used to repair a chuckhole in an asphalt pavement. No fuss—no muss—no traffic congestion.

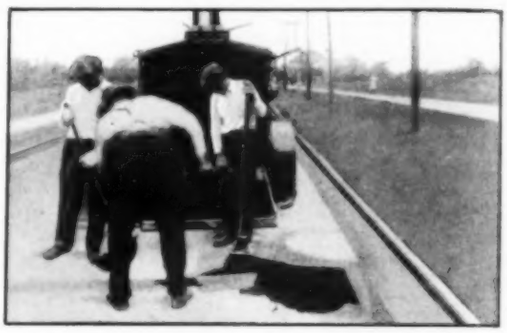
Leaning Wheel Graders
Straight Wheel Graders
Motor Graders
Elevating Graders
Dump Wagons
Crawler Dump Wagons
Scarifiers
Rock Crushers
Portable Conveyors
Rollers (Steam and Motor Driven)
Motor Sweepers
Street Sweepers
Sprinklers
Road Oilers
Corrugated Culverts
Hot Patch Repair Outfits
Plows and Scrapers

Austin-Western
ROAD MACHINERY

"MOST MILES FOR YOUR ROAD DOLLARS"

Low Cost Pavement Maintenance

With the Western Hot Patch Outfit the low spots in brick pavement can be filled without moving the old brick.



The Western is an indispensable part of every maintenance outfit for doing work like this on concrete pavements, in winter or summer.

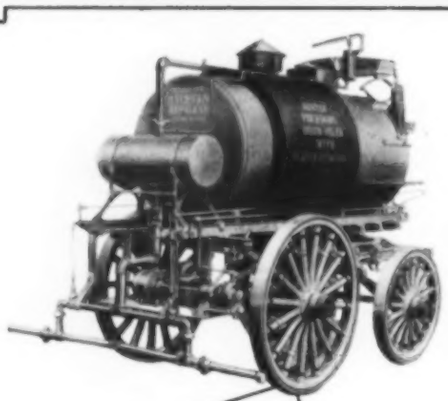
The Western Hot Patch Outfit

makes old pavements new

The proper upkeep of old paving has for years been a thorn in the side of everyone who carries the responsibility for maintenance work. The Western Hot Patch Road Repair Outfit has solved all of these troublesome problems.

Authorities say that a hot patch is the best patch. It is more permanent and it can be laid in cold weather when any other method is impossible. The Western combines in a single outfit everything needed to make a perfect hot patch, including asphalt, sand, stone, cement and stone dust. The heated materials are mixed in the pan and applied directly to the hole in the pavement, making a patch that will last as long as the pavement itself, and that can be opened to traffic almost immediately.

Instead of a costly central asphalt plant, the repair material is prepared on the job, no more than is needed, and put in HOT, the only way to make a lasting patch.



Austin Pressure Road Oilers

The use of oil is one of the most economical methods of preventing dust and mud, of gradually building up a protective surface coating, and of resurfacing old roads. With the Austin Pressure Road Oiler the majority of oils and tars can be applied at the right temperatures and in the right quantities to insure correct results. The horse drawn type with heater attachment at the left, is the most popular model. We also furnish units for mounting on motor trucks as well as complete trailer oilers.

The Austin-Western Road Machinery Co.
Dept. 1409 400 N. Michigan Ave., Chicago, U. S. A.

☑ Motor Graders ☐ Scarifiers ☐ Road Graders ☐ Snow Plows
☐ Rollers ☐ Portable Conveyors ☐ Rock Crushers ☐ Oilers
☐ Dump Wagons ☐ Street Sweepers ☐ Elevating Graders ☐ Sprinklers
☐ Hot-Patch Repair Outfits ☐ Plows and Scrapers

Please send literature and full information on items checked.

Name.....

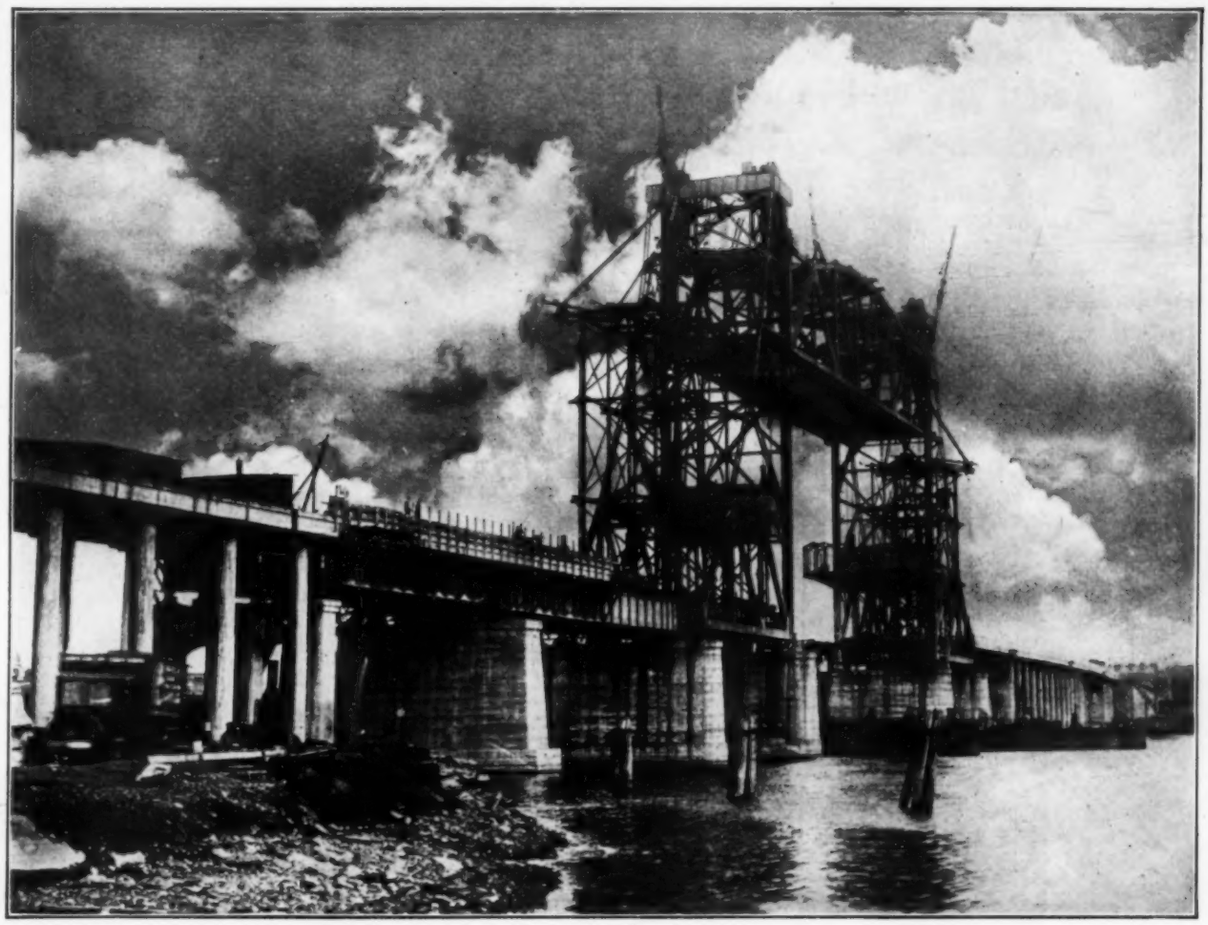
Address.....

.....

The Austin-Western Road Machinery Co.

400 North Michigan Avenue
Chicago, Illinois, U. S. A.

Branches in Principal Cities



Hackensack River Bridge *Jersey City, New Jersey*

Delaware, Lackawanna & Western R. R.
River Piers Constructed by The Foundation Company

The Hackensack River Bridge of the Delaware, Lackawanna, and Western Railroad, was built to speed up suburban traffic into New York. The five river piers were constructed by The Foundation Company. Four of these piers, supporting the lift and tower spans, were sunk to rock by the pneumatic caisson method;—the fifth pier was founded on piles.

THE FOUNDATION COMPANY
CITY OF NEW YORK

Office Buildings
Industrial Plants
Warehouses
Railroads and Terminals
Foundations and Underpinning
Filtration and Sewage Plants

ATLANTA
PITTSBURGH
CHICAGO
SAN FRANCISCO

MONTREAL
MEXICO CITY
CARTAGENA, COLOMBIA
LIMA, PERU

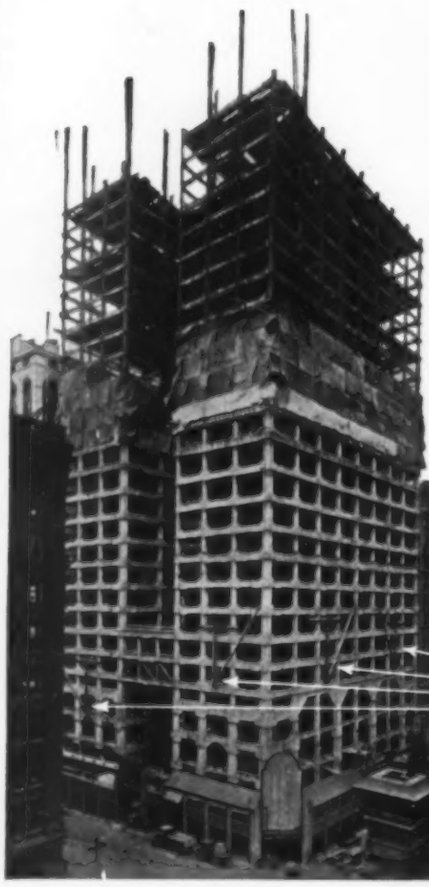
LONDON, ENGLAND
PARIS, FRANCE
BRUSSELS, BELGIUM
TOKYO, JAPAN

Hydro-Electric Developments
Power Houses
Highways
River and Harbor Developments
Bridges and Bridge Piers
Mine Shafts and Tunnels

BUILDERS OF SUPERSTRUCTURES AS WELL AS SUBSTRUCTURES

CLYDE

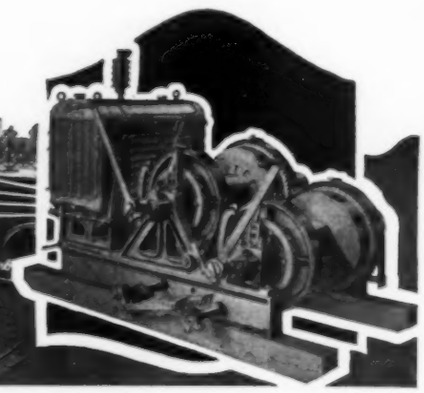
HOISTS CLYDE DERRICKS



Clyde Gasoline hoists have established an enviable record in stone setting, an operation requiring perfect power control. On the Penobscot Building, Detroit, four Clyde two-drum units were used by A. A. Albrecht Co., general contractors, who are thoroughly pleased with the performance of the machines.

You will find in Clyde hoists every proven device that will add to safety or to perfect control by the operator. Users everywhere admit their satisfaction by placing repeat orders when in need of additional equipment.

You'll Take Pride In Your Clyde!



CLYDE IRON WORKS SALES CO.

DISTRIBUTORS FOR CLYDE IRON WORKS DULUTH, MINNESOTA

— BRANCHES —

NEW ORLEANS: 309 MAGAZINE ST.
NEW YORK CITY: 856 EAST 136TH STREET
PORTLAND, OREGON: 555 THURMAN ST.
SEATTLE: 3410 FIRST AVENUE SOUTH
VANCOUVER, B. C.: STANDARD BANK BLDG.

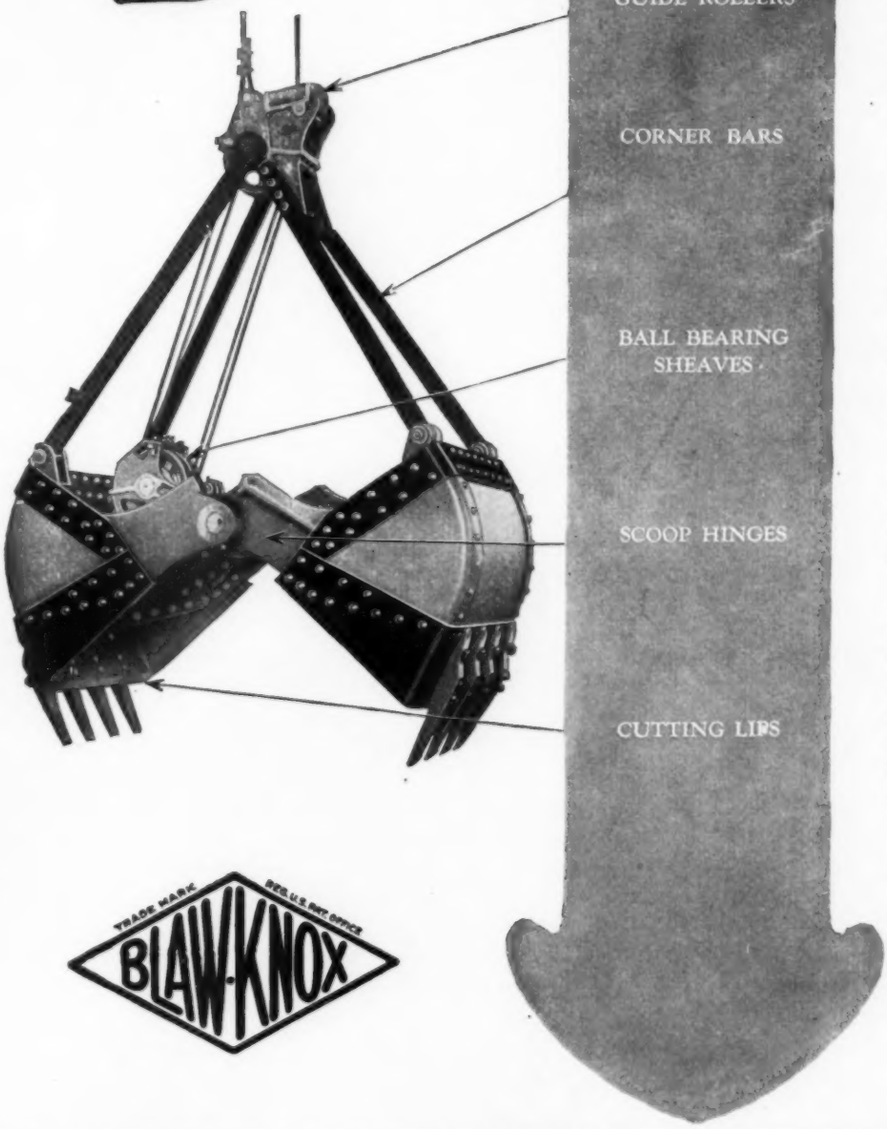
CHICAGO: 11 SOUTH LASALLE STREET
CINCINNATI: 201 W. PEARL ST
MEMPHIS: 69 UNION AVENUE
JACKSONVILLE, FLA.: 112 W. ADAMS ST.
DALLAS: 508 REPUBLIC BANK BLDG.
OMAHA: 1003 FARNHAM ST.

CLYDE TWO MARKS OF GUARANTEED QUALITY

SUCCESSFUL PERFORMANCE FOR AGC-A-E

BALL BEARING SHEAVES

and other features that contribute to the long life, greater digging ability and low maintenance costs of BLAW KNOX BUCKETS



ONE-PIECE CAST HEAD

Cables are kept free from "S" bends and kinks, reducing cable wear to the minimum.

CORNER BARS

Forged from solid billets without welds. They absorb without harm much of the abuse that a bucket must receive.

BALL BEARING SHEAVES

Hailed as the greatest improvement in bucket design in 20 years. This feature reduces friction losses to the minimum, extends maximum power to the line pull and reduces strain throughout. Lubrication neglect is discounted because grease is sealed in— sand and grit are locked out.

SCOOP HINGES

Massive construction maintaining positive alignment and rigidity of scoops.

CUTTING LIPS

Hardened by an exclusive Blaw-Knox process to a degree more than double that found in ordinary buckets. Here where wear is greatest, cutting edges are made to maintain sharpness and penetrating qualities.

TRADE MARK REG. U.S. PAT. OFFICE
BLAW-KNOX

Learn more about these scientifically constructed long-lived buckets. The coupon is for your convenience.

District Offices

New York Philadelphia Chicago
Detroit Birmingham Buffalo
Baltimore Cleveland

Export Division

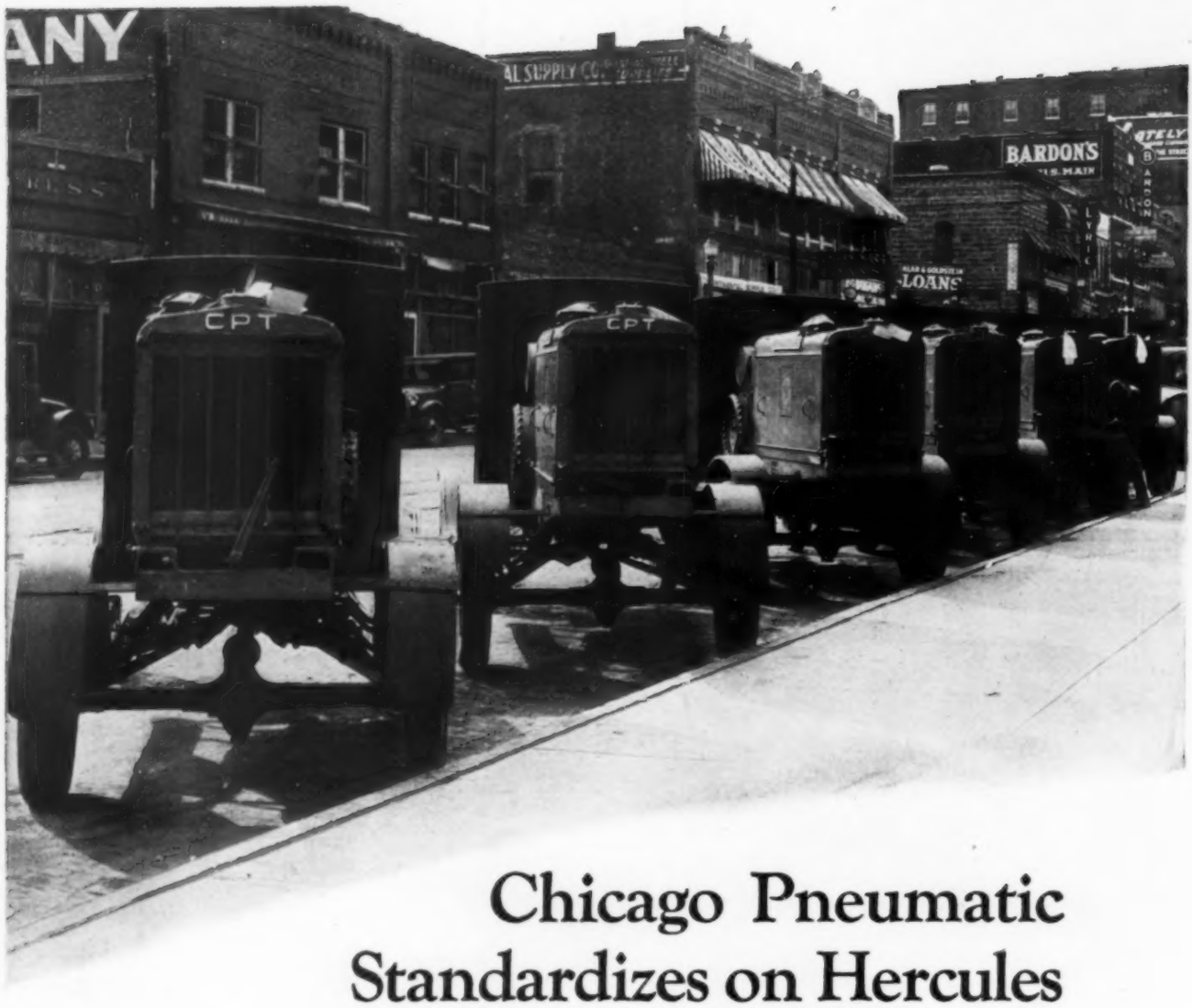
Milliken Bros.—Blaw Knox Corp.
Canadian Pacific Bldg., New York.

BLAW-KNOX COMPANY

686 FARMERS BANK BUILDING, PITTSBURGH, PA.

Please send Bucket catalogue to

ADDRESS
NAME .....
STREET .....
CITY OR TOWN .....



Chicago Pneumatic Standardizes on Hercules

Unfailing performance, low upkeep costs, and ability to run with little attention, together with endurance, have established Hercules Engines as standard power in this *internationally* known make of compressors.

Utmost reliability in widely different uses has earned Hercules Engines an enviable reputation. In road building and general contracting equipment, farm implements, marine equipment, railroad power equipment, commercial transportation units, and oil-field equipment, Hercules Engines can be depended on to furnish unfailing power to serve both operating and economy needs.

HERCULES MOTORS CORPORATION

General Offices
Canton, Ohio, U.S.A.

West Coast Branch
Los Angeles, Cal.

Hercules Engines

Just as *tough* as it looks!

A "tough job"—bulldozing rock that has been dumped on dirt! But it's all in the day's work for the "Caterpillar" Tractor... with its plentiful power, sure grip on the ground and sinews of heat-treated steel . . . And it was a "Caterpillar" that hauled this rock, in a 10-yard bottom-dump wagon on a road-building job in Pennsylvania.

The spectacular stunts prove the reserve power of "Caterpillars" for the every-day humdrum tasks.

SIXTY - $4600
THIRTY - $2650
TWENTY $2175
F.O.B. SAN LEANDRO OR PEORIA

2-TON
$1675
F.O.B. PEORIA

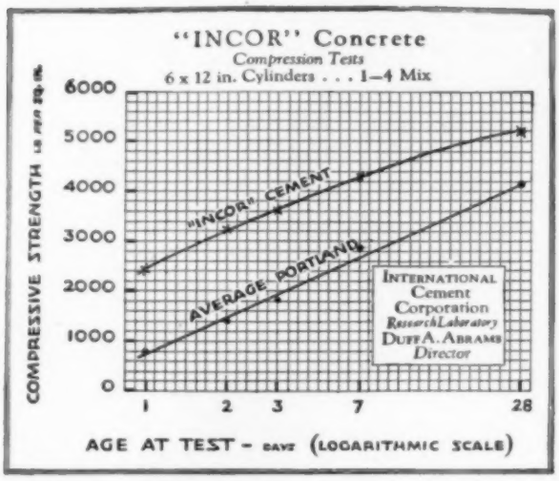
CATERPILLAR TRACTOR CO.
Executive Offices: San Leandro, California, U.S. A.
Sales Offices and Factories:
Peoria, Illinois San Leandro, California
Distributing Warehouse: Albany, N. Y.
New York Office: 50 Church Street
Successor to
BEST C. L. Best Tractor Co. The Holt Manufacturing Company HOLT

CATERPILLAR
REG. U.S. PAT. OFF.
TRACTOR

Fire engines can't wait... therefore "INCOR"

IT became necessary recently to put down a new concrete driveway in front of the fire house at Palmyra, N. Y. "What if we have to use the driveway before the concrete hardens?" was the question raised with some anxiety. "INCOR," the perfected high-early-strength Portland Cement, solved the problem. An alarm was turned in 23 hours after the concrete made with "INCOR" Cement was placed. The big five-ton "chemical" charged over the new driveway without the slightest effect upon the concrete.

Concrete made with "INCOR" is ready to use in 24 hours. Yet it has the time-tested permanence of Portland Cement because it is a *perfected Portland Cement* in every sense of the term.



Specification for "*Incor*" Cement

"INCOR" Cement is a perfected high-early-strength Portland cement and is guaranteed to conform with all requirements of the Standard Specifications and Tests for Portland Cement of the United States Government and the American Society for Testing Materials. In addition, "INCOR" Cement is guaranteed to exceed the standard specifications in the following items:

Fineness: The residue on a standard 200 sieve shall not exceed 10% by weight.

Tensile Strength: The average tensile strength in pounds per square inch of not less than three standard mortar briquets composed of one part of cement and three parts of standard sand, by weight, shall be equal to or higher than the following:

Age at Test	Storage of Briquets	Tensile Strength lb. per sq. in.
24 hr.	In molds in moist air for 24 hr.	250
48 hr.	(1 day in moist air) (1 day in water)	350

The average tensile strength of standard mortar at 48 hours shall be higher than the strength at 24 hours.

"INCOR" Perfected High Early Strength PORTLAND CEMENT

Made and guaranteed by the Manufacturers of Lone Star Cement

International Cement Corporation
342 Madison Avenue New York

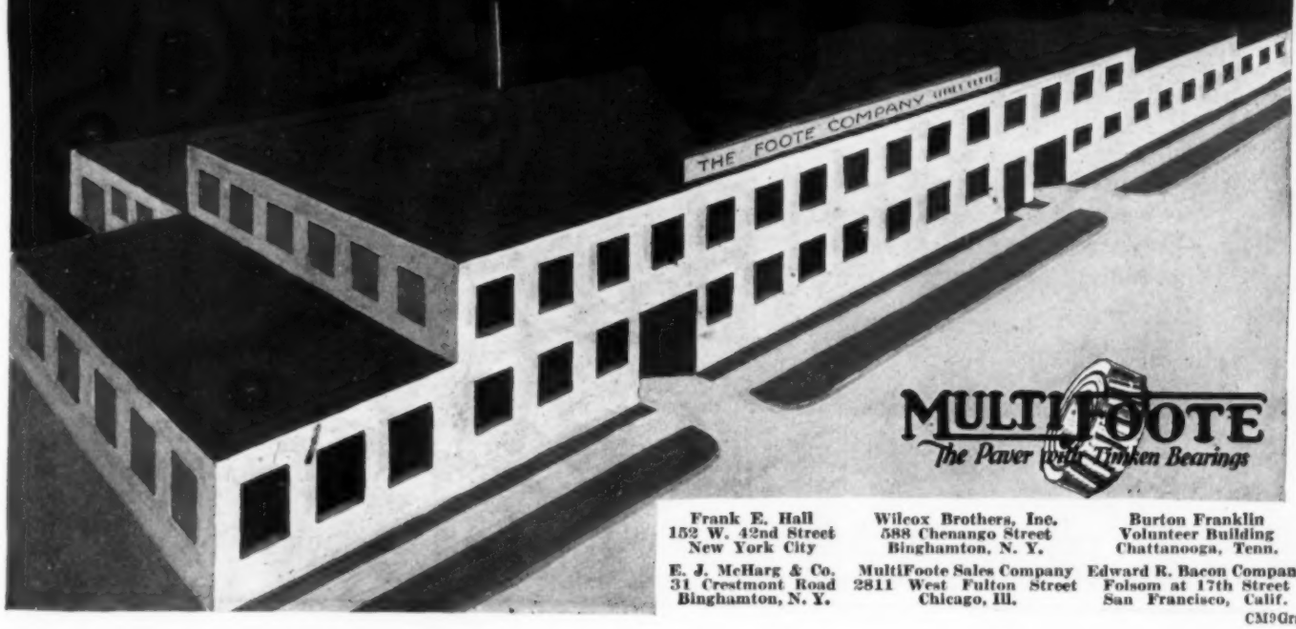
One of the world's largest cement producers—13 mills . . . total annual capacity 20,000,000 barrels

SUBSIDIARIES

ALABAMA PORTLAND CEMENT CO. Birmingham Alabama
INDIANA PORTLAND CEMENT CO. Indianapolis Indiana
THE CUBAN PORTLAND CEMENT CORP. Havana Cuba
LONE STAR CEMENT CO. OF PA. Philadelphia Pennsylvania
THE KANSAS PORTLAND CEMENT CO. Kansas City Missouri
VIRGINIA PORTLAND CEMENT CORP. Norfolk Virginia
KNICKERBOCKER PORTLAND CEMENT CO., Inc. Albany New York
LOUISIANA PORTLAND CEMENT CO. New Orleans Louisiana
ARGENTINE PORTLAND CEMENT CO. Buenos Aires Argentina
TEXAS PORTLAND CEMENT CO. Dallas and Houston Texas
URUGUAY PORTLAND CEMENT CO. Montevideo Uruguay

The world's largest exclusive builders of road pavers

The Foote Company, Inc. of Nunda, N.Y.



MULTIFOOTE
The Paver with Timken Bearings

Frank E. Hall
152 W. 42nd Street
New York City

Wilcox Brothers, Inc.
588 Chenango Street
Binghamton, N. Y.

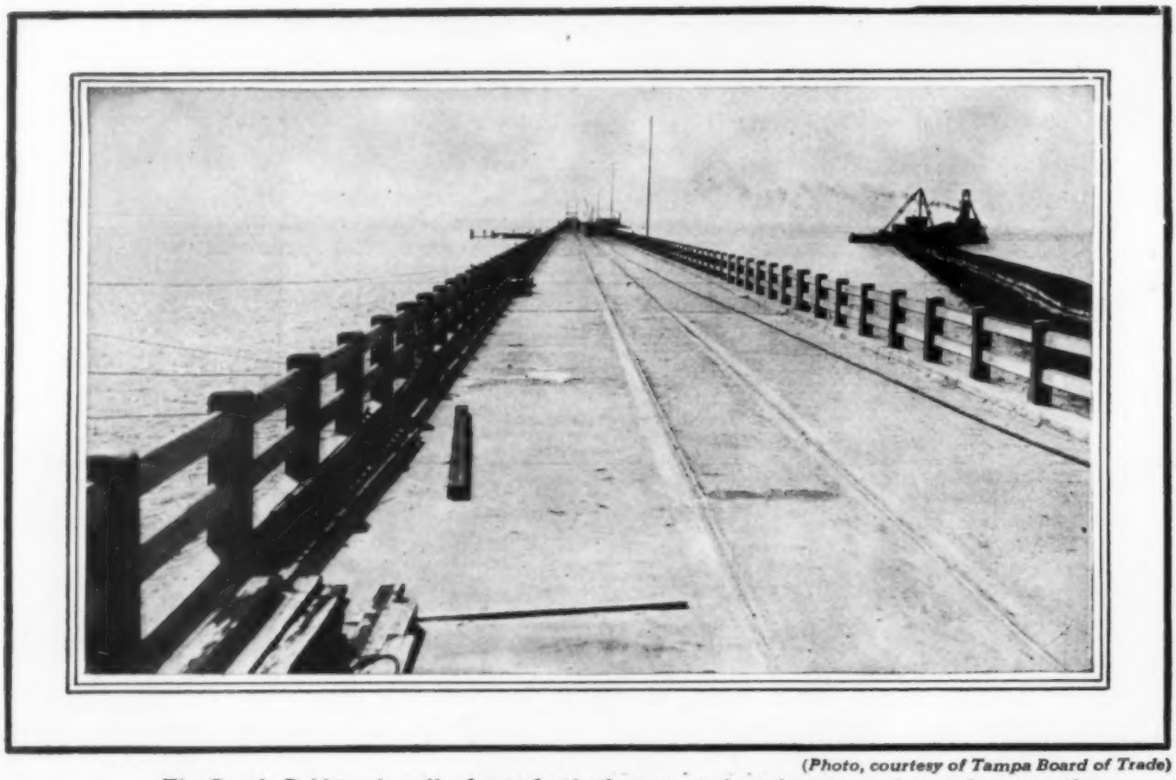
Burton Franklin
Volunteer Building
Chattanooga, Tenn.

E. J. McHarg & Co.
31 Crestmont Road
Binghamton, N. Y.

MultiFoote Sales Company
2811 West Fulton Street
Chicago, Ill.

Edward R. Bacon Company
Folsom at 17th Street
San Francisco, Calif.

CM9Gra



(Photo, courtesy of Tampa Board of Trade)

The Gandy Bridge, six miles long—lastingly protected against expansion and contraction stresses by Carey Elastite Expansion Joint, installed transversely at frequent intervals.

From Tampa to St. Petersburg —SIX MILES, over Tampa Bay

THE Gandy Bridge, spanning Old Tampa Bay, is the longest auto toll-bridge in the world. Imagine how that six-mile, concrete traffic surface expands and contracts!

But the Gandy Bridge is protected—well protected—against over-stress hazards. Protected by Carey Elastite Expansion Joint, which absorbs the strains and prevents cracking. This remarkable material was used freely, transversely across the concrete floor and up through the hand-rail.

Carey Elastite Expansion Joint is used in bridges, streets, roadways, sidewalks, swimming - pools, culverts, stadiums — wherever concrete is used. It eases strains, absorbs expansion and contraction, protects the concrete against disintegration. Easy to handle, and it keeps its shape in any weather. Write for photographs and information about modern methods of expansion joint installation.

Carey Elastite EXPANSION JOINT

THE PHILIP CAREY COMPANY, *Lockland,* Cincinnati, Ohio

The strongest, most powerful bucket possible to build—that explains in a few words why so many bucket users prefer the Owen Type "D" Bucket, especially for heavy duty work.

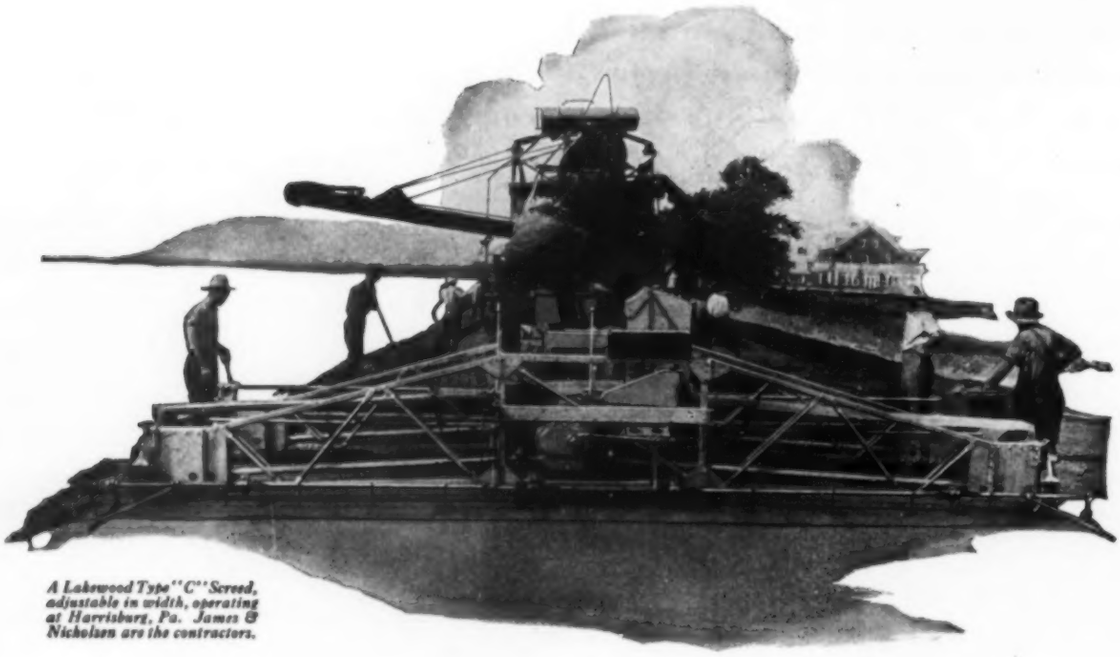
Unusually sturdy design in every part . . . extra reinforcement where the hardest bumps are to be met . . . one piece extra-heavy renewable jaws . . . and Owen grit-proof lubricated bearings. Owen Type "D" Heavy Duty Buckets are particularly efficient and wear-resistant for all work where buckets are subjected to exceedingly severe strains such as dredging coarse gravel or digging stiff clay, broken rock, slag and shale.

Type "D" Owen Buckets uphold the positive Owen Guarantee—"a bigger day's work—and insurance against breakage." Write for the Owen complete catalog. The Owen Bucket Company, 6023 Breakwater Ave., Cleveland, Ohio.

OWEN CLAMSHELL BUCKETS INSURE A BIGGER DAY'S WORK

Owen Buckets

LAKEWOOD PAVING EQUIPMENT



A Lakewood Type "C" Screed, adjustable in width, operating at Harrisburg, Pa. James & Nicholson are the contractors.

Adjustable In Width

Close up view of widening fixture on the adjustable Lakewood Type "C" Screed

THE new Lakewood Type "C" Screed can now be secured with adjustability for two widths of road, either 16 and 18 ft., 18 and 20 ft. or any other two-foot combination. The advantage of this adjustability is plain to every contractor.

The change to a different width can be quickly made right on the job. Telescoping drive shafts eliminate the necessity for any new or additional change parts on the machine.

Here again is an example of the adaptability of the "Modern Mechanical Screed"

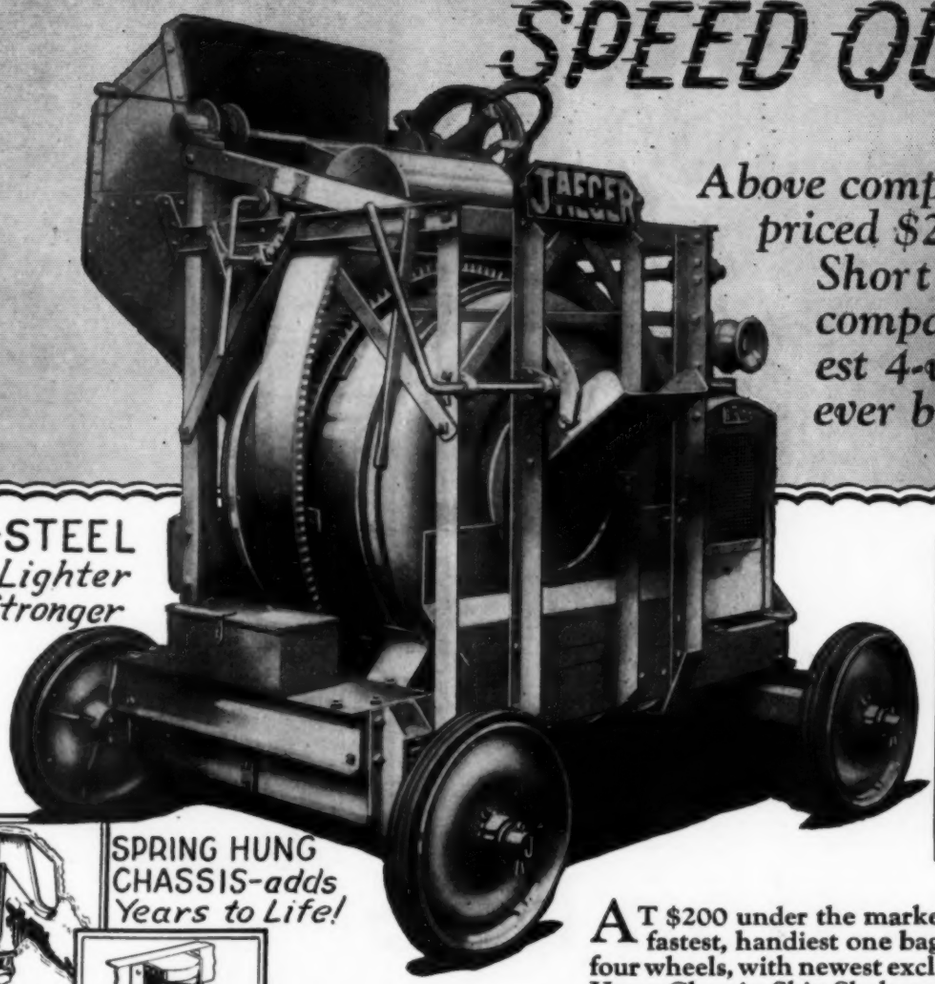
EXPORT OFFICES: 30 Church St., New York City - - *CABLE ADDRESS:* Brosites

LAKEWOOD

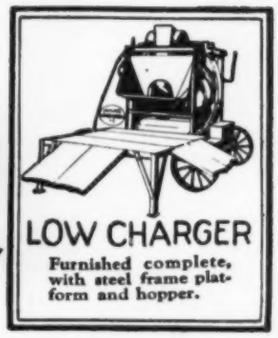
The Lakewood Engineering Co., CLEVELAND - O.

Spring Mounted on 4 Wheels
Jaeger's New Full One Bagger
SPEED QUEEN

Above comparison—yet priced $200 Lower! Shortest—most compact—huskiest 4-wh. Mixer ever built—



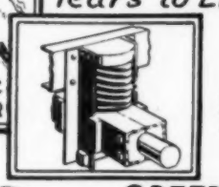
ALL-STEEL
—Lighter 50% Stronger



LOW CHARGER
Furnished complete, with steel frame platform and hopper.

SPRING HUNG CHASSIS—*adds Years to Life!*

AUTOMATIC SKID SHAKER
Shakes loader clean without pounding.



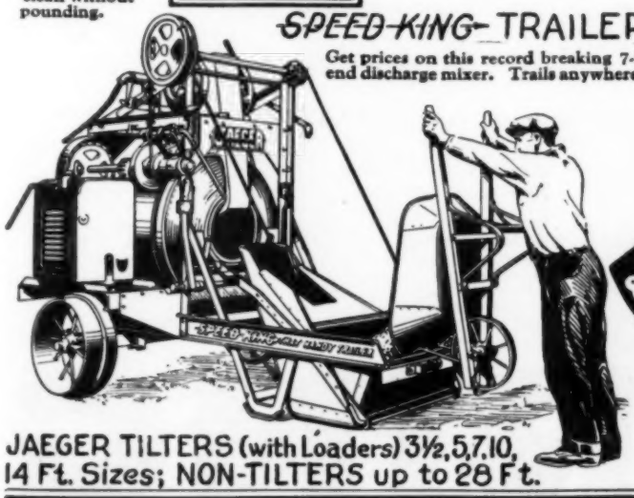
Springs save wear on tires and mixers.

AT $200 under the market you can now get the fastest, handiest one bagger ever mounted on four wheels, with newest exclusive features—Spring Hung Chassis, Skip Shaker and All-Steel construction (50% stronger, ½ ton lighter.)

Our production advantages as the world's biggest mixer manufacturer have made this price possible. You can't find its equal.

Takes 7 seconds to charge, 7 - 10 seconds discharge. Short coupled, 100% ball bearing rollers and counter shaft, one man control, 2 cylinder Le Roi engine, Accurate Measure Water Tank.

SPEED-KING TRAILER
Get prices on this record breaking 7-S end discharge mixer. Trails anywhere.

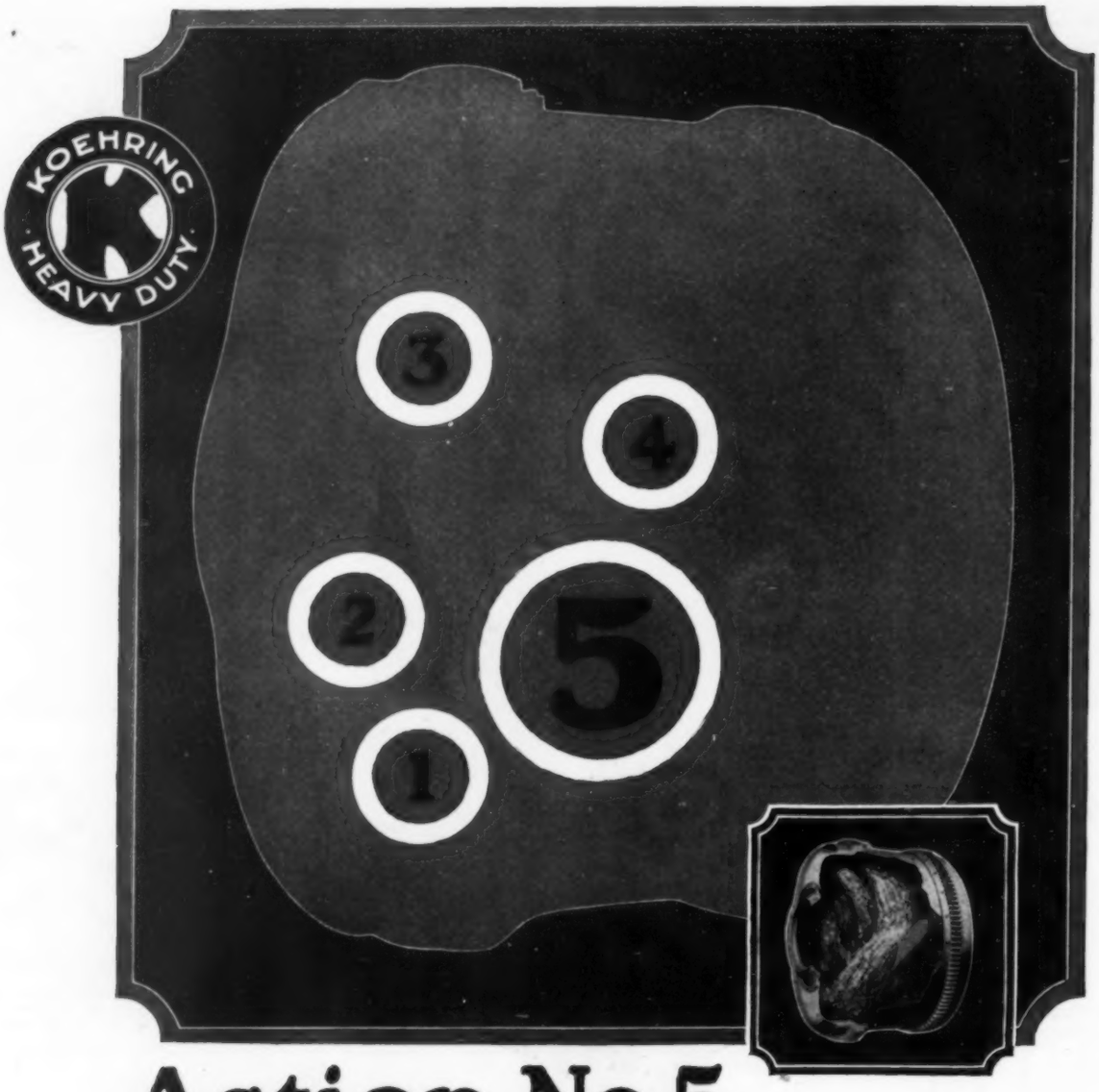


JAEGER TILTERS (with Loaders) 3½, 5, 7, 10, 14 Ft. Sizes; NON-TILTERS up to 28 Ft.

The Jaeger Machine Co.
800 Dublin Ave., Columbus, Ohio
Branches and Service in Over 100 Cities

Mail for Catalog & Prices

The Jaeger Machine Co. Date .....
800 Dublin Ave., Columbus, O.
☐ Non-Tilters ☐ Tilters ☐ Plaster Mixers
Name .....
Address .....



Action No. 5

PREVENTS separation of aggregate according to size — returns material back to charging side for repeated trips through the mixing process — the Koehring remixing action.

That's made possible only by the Koehring construction which pivots the discharge chute far inside the drum.

Write for Paver Catalog P-17.

KOEHRING COMPANY
PAVERS, MIXERS—GASOLINE SHOVELS, CRANES AND DRAGLINES
MILWAUKEE, WISCONSIN
Sales Offices and Service Warehouses in all principal cities
Foreign Department—Room 579, 50 Church St., New York City
Mexico, F. S. Lapum, Cinco De Mayo 21, Mexico, D. F.

Koehring remixed concrete is dominant strength concrete, uniform to the last shovelful of every batch. Inspection-proof!

Know the Koehring!

SIZES

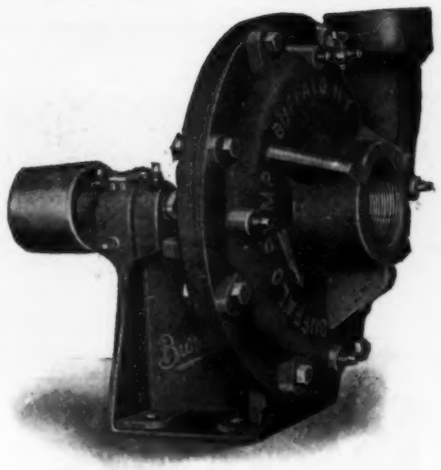
Pavers — 13-E, 27-E. Auxiliary equipment and choice of power to suit individual needs. Complies with A. G. C. Standards.

Construction Mixers—14-S, 21-S, 28-S. Steam, gasoline or electric power. Mounted on trucks or skids. Rubber tired wheels optional. 28-S on skids only. Complies with A. G. C. Standards.

Dandie Mixer—5-S, 7-S, 10-S: — 5-S single cylinder, 7-S, 10-S two or four cylinder gasoline engine. Power charging skip, or low charging hopper and platform. Rubber tired steel disc wheels or steel rimmed wheels. Complies with A. G. C. Standards.

A4784-1

KOEHRING



Driven by belt or
direct by electric motor or gas engine

TESTS PROVE THESE "CH" PUMPS THE BEST VALUE ON THE MARKET

Designed for General Utility Service Pumping from 10 to 500 G.P.M. Against a "Head" of from 10 to 120 Feet.

What is *your* pumping problem? If the conditions are within the range of gallons per minute and "head" as given above, a "CH" Pump is your best bet for trouble-free service at the right price.

No matter if you want to install this pump in an industrial plant, pump water to a construction job, or hook it to a Ford truck with a power take-off for portable service—a "CH" Pump offers you the biggest value for your money, especially when Buffalo Quality is considered.

A "Buffalo" "CH" will take on the toughest, continuous service job and lick it to a stand-still. Keep it within its rated capacity and you can hardly find a set of "special" conditions that will bother a Buffalo Pump.

"CH" Pumps are now being used by contractors, city sewer and water departments, industrial plants, electric companies (for dewatering manholes), by railroads, etc., etc.

Additional details, prompt delivery and service may be had thru our branch offices located in the following cities:—

Atlanta	New York	Toledo
Boston	Omaha	Washington
Chicago	Philadelphia	
Charlotte	Pittsburgh	
Cincinnati	San Francisco	
Cleveland	Seattle	
Detroit	St. Louis	
Indianapolis		
Los Angeles		
Minneapolis		
New Orleans		

Mail today for more information.

Buffalo Steam Pump Co., Buffalo, N. Y.

Please send to .....

Address .....

Complete information on your line of "CH" Pumps. I want to pump — gal. per min. against a head of — ft.

Buffalo Steam Pump Company

183 Mortimer St., Buffalo, N. Y.

"Pump Builders for Half a Century"

In Canada: Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

IRON MULE

The Original 2 Yard Tractor Dump

Humping Loads 20 Hours a Day!

ON-THE-JOB experiences convince contractors before they buy that this sensational Hughes-Keenan short-haul dump unit has other dirt-moving equipment licked in cost-per-load performances.

On the Studer Manion job at Hawley, Minn., five "Iron Mules" are working 20 hours a day—hustling and dumping loads—night shift working with carbide lights. That's gluttonous stamina!

The Hughes-Keenan Iron Mule is a complete 2-yd. gravity dump unit mounted on the husky McCormick-Deering Tractor.

Write for full story and the name of a contractor near you who is using "Iron Mules."

THE HUGHES-KEENAN CO., Mansfield, Ohio

HUGHES-KEENAN
Steel Dump Bodies

BAKER

ONE-MAN AUTOMATIC

Rotary Scrapers

Larger capacity—increased yardage. Automatic draft control permits continuous operation. No stopping. Narrow replaceable cutting edge cuts upkeep costs. Four sizes for any tractor—capacities 13 to 40 cu. ft.

Send for Bulletin No. 256

The Baker Manufacturing Co.
568 Stanford Ave., Springfield, Ill.

Buhl

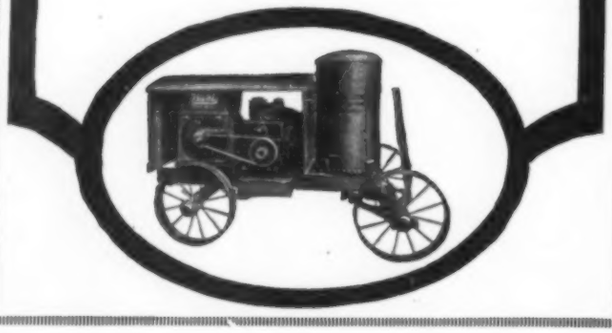
AIR COMPRESSORS

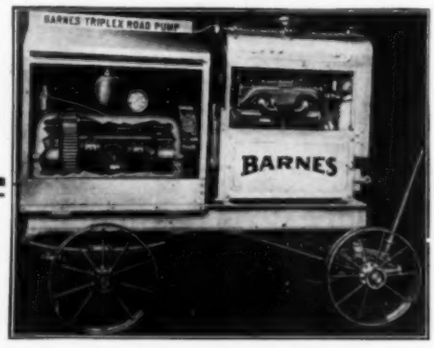
Below is illustrated the BUHL Type C Portable Compressor—one of the many different types of this popular line. Moderate in original cost and low in upkeep.

There are six sizes of portable air compressors in the BUHL line to choose from. For operating jack hammers, riveters, clay spades, concrete breakers, etc. The BUHL gives dependable air power at low cost—send for bulletins today.

Sales offices in principal cities

THE BUHL COMPANY
Manufacturers
37 W. Van Buren St., CHICAGO





BARNES PUMPS

These features on Barnes Triplex Road Pumps insure more water per dollar.

1. Most simple, self-oiling system—one moving part rotary pump.
2. All Steel gears.
3. Forged crankshaft—not cast.
4. Three point suspension truck, spring mounted.
5. Roller bearings on all shafts, including crankshaft.
6. Water cylinders detachable from power end.
7. Flexible coupling between pump and engine.
8. Rubber tired roller bearing wheels, interchangeable with standard steel wheels.

THE
BARNES MANUFACTURING CO.
923 MAIN ST., MANSFIELD, OHIO

HIGHEST COURT AGAIN* SUSTAINS PNEUMATIC PLACING PATENTS!

United States Circuit Court of Appeals for Second Circuit Again Holds McMichael Patent Broadly Valid, and Infringed.

New York City, July 16th, 1928—The Court of Appeals in New York sustained the decision of the District Court in the suit of the Concrete Mixing and Conveying Company vs. Powers-Kennedy Contracting Corporation and another.

In this case the defendants claimed that they did not infringe (1) because their apparatus differed from that of the McMichael patent, No. 1,127,660 in suit, in form and method of operation and (2) because they disconnected the air inlet at the top of the apparatus. They also contested the validity of the patent on numerous prior patents and an alleged prior use of similar apparatus in Chicago in 1904.

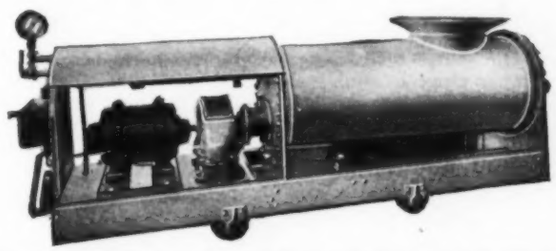
The Court of Appeals affirming the trial court, held that their apparatus was covered by the claims of the McMichael patent and infringed them, and that the prior use was not sustained.

In this decision the McMichael patent is given a broad interpretation, the court finding that in the use of the defendant's apparatus with the bottom air jet only, the patented process was practiced, and that regardless of the particular way in which the concrete was discharged and conveyed by their apparatus, the patent was infringed. Concerning the theories relating to the manner in which the McMichael apparatus operates the Court said:

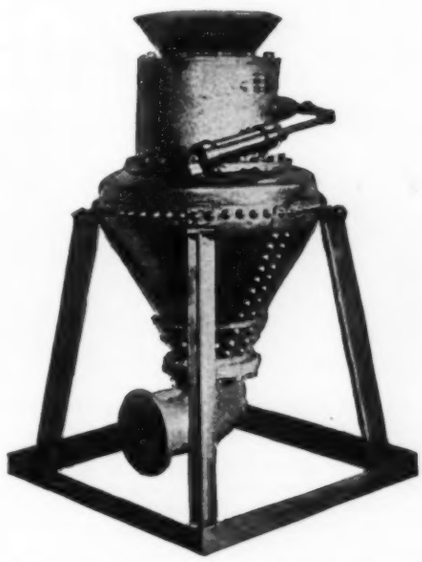
> "To us the dispute seems irrelevent. The patent says nothing which commits the patentee to the slug method of operation."
>
> "But whether the concrete goes forward as we imagine or in some other manner, there is no sufficient reason to suppose that defendant's machine does not operate in the same manner as plaintiff's whatever manner that may be."

The court further held that the McMichael patent covers the use of both wet and dry concrete.

* For other decisions sustaining the McMichael patent see Concrete-Mxg. & Conv. Co. vs. Ulen and Shandaken, 12 Fed. (2nd) 929, and Concrete Mxg. & Conv. Co. vs. Powers-Kennedy and Fleck, (U. S. District Court, N. Y.)

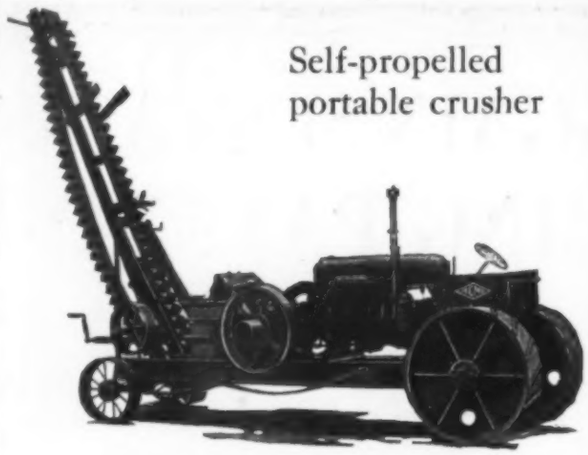


RANSOME PNEUMATIC CONCRETE PLACER HORIZONTAL TYPE



RANSOME PNEUMATIC CONCRETE PLACER VERTICAL TYPE

Ransome Concrete Machinery Co.
Dunellen, N. J.
(Sole Licensee)
Concrete Mixing & Conveying Co.
9 S. Clinton St., Chicago



Self-propelled portable crusher

ACME Crushers

THERE are Acme Stone Crushers suited to practically any stone crushing job. Portable or stationary.

The self-propelled portable crusher shown here is a big time and money saving unit. Can be moved under its own power direct to any stone supply along the road and then put immediately to work by a single shift of the clutch. Users say Acme Plants can't be beat for field and road work.

We manufacture a complete line of Crushers, Rollers and Graders. Ask for Catalogs.

Acme Road Machinery Co.
Frankfort, N. Y.

Moving Earth at a Saving of 40c on the Dollar

Sauerman Power Scrapers are saving many dollars for the contractor. A Sauerman Power Scraper can do the combined work of excavating and conveying equipment and the investment is much less. The operating costs are equally low, and your payroll amounts to that of one man—the operator.

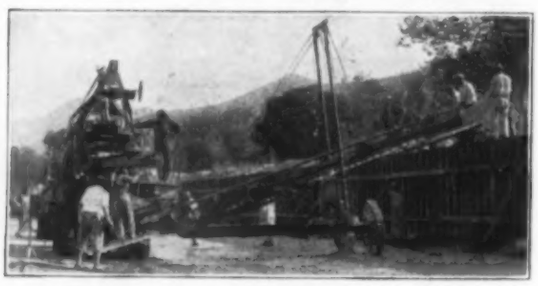
It works in wet, sticky or dry materials. It can reach out and dig across the area 500 ft. or more in width, moving the materials from cut to fill at the rate of 30 to 50 loads per hour.

One superintendent of a large construction company writes: "Our costs per cu. yd. of materials excavated on 3 jobs where we have used a Sauerman Power Scraper average over 40% lower than our costs on similar work before we had this machine."

Send for Catalog No. 10. See for yourself how costs can be cut.

SAUERMAN BROS., Inc.
480 S. Clinton St., CHICAGO

For 2 Cents



See How Other Contractors Handle Wet Concrete—Faster—Cheaper

Send for a copy of the new "Wet and Dry" folder showing how other contractors eliminate expensive chutes, towers, hoists, barrows and a gang of men for handling wet concrete from mixer to forms. The coupon will bring you a copy by return mail. Send it in now.

Name .....

Address .....

City ..... State .....

Company .....

BARBER-GREENE CO. 530 W. Park Av., Aurora, Ill.

BARBER B G **GREENE**

Portable Belt Conveyors Self Feeding Bucket Loaders

ROLLERS

The Up-to-dateness of the BUFFALO SPRINGFIELD

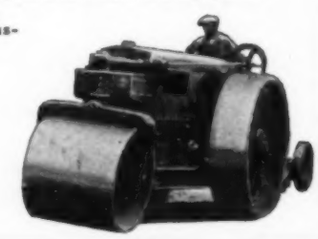
accounts for the nation-wide preference of street and road builders for this particular make of equipment. That this preference actually does exist all over the country may be verified very quickly by anyone inclined to make a survey of the roller equipment in use in his particular section of the country.

Buffalo-Springfield rollers, both motor and steam, are designed to meet all sorts of conditions and are built in many models and sizes.

Scarifiers and other special attachments optional.

Send for Latest Booklet illustrating entire line.

The Buffalo-Springfield Roller Co.,
Springfield, Ohio



Hoisting heavy loads with safety

The use of Roebling Wire Rope Slings insures greater safety in handling steel beams, columns, girders, and is a valuable part of the hoisting equipment in industrial plants, bridge building and construction work. They are made of our "Blue Center" Steel Wire Rope and equipped with equalizing thimbles. Forgings in tension are eliminated wherever possible.

Increase the safety, economy and efficiency of your equipment by using

Roebling

"Blue Center" Steel
Wire Rope Slings

Our new catalog on Roebling Wire Rope Slings, A-546, will be gladly furnished on application.

John A. Roebling's Sons Company — Trenton, New Jersey

UNIVERSAL repair part sales average only $62 per year per crane

DUG 11 BASEMENTS IN 7 DAYS and EARNED $713.00

$713 in Earnings and 11 basements dug for 11 satisfied customers is one week's work of the motor truck mounted Universal Crane of the C. H. Last Crane Service Company—the Figures:—

	DATE—1928	SIZE BASEMENT	CAST OR LOADED	HRS. ON JOB	PRICE OBTAINED	DISTANCE BETWEEN JOBS
1.	WED. 4/18	244 YDS.	CAST & RECAST	10 1/2	$98.00	2 MILES
2.	THURS. 4/19	250 "	" "	10 1/2	100.00	1 MILE
3.	FRI. 4/20	150 "	" "	6	60.00	6 MILES
4.	FRI. 4/20—SAT. 4/21	195 "	" "	7 1/2	78.00	1 MILE
5.	SAT. 4/21	110 "	" "	4	44.00	1 MILE
6.	SUN. 4/22	97 "	" "	2 1/2	39.00	2 BLOCKS
7.	SUN. 4/22—MON. 4/23	179 "	" "	6 3/4	72.00	7 MILES
8.	MON. 4/23	185 "	" "	7 3/4	74.00	5 BLOCKS
9.	TUES. 4/24	100 "	" "	3 1/2	40.00	2 BLOCKS
10.	TUES. 4/24	111 "	" "	4	44.00	NEXT DOOR
11.	TUES. 4/24	161 "	" "	6	64.00	NEXT DOOR

CONFIDENCE

9 of these were new customers—showing how Universal Money Saving Performance, attracts new customers, holds old ones and keeps itself busy.

YARDAGE

A total of 1782 yds. dug in 69 hours — and all materials RECAST, so practically this Universal handled twice this yardage in 69 hours.

PROFITS

$713 in 7 days — over $100 per day earned by this Universal with nothing but bare crane operating costs to be deducted, leaving a BIG daily profit.

MOBILITY

9 jumps in 7 days totalling 19 miles, requiring only 2 hours of road travel of the motor truck mounted Universal, with practically no moving expense.

For excavations of 100 to 2,000 yards, especially footings and deep holes—do you know of any other excavating tool that possesses the mobility, speed, flexibility and earning power of a Universal Crane? Bulletin 212-D covers all types of digging and a score of other jobs—ask for a copy today, it's interesting.

THE UNIVERSAL CRANE CO., E. 28th St. & Fulton Rd., Lorain, O.

The Universal Crane Co., E. 28 St. and Fulton Rd., Lorain, O.
Send me the "brass tack" information in Bulletin 212-D

NAME _____

CO. NAME _____

STREET _____

CITY _____ STATE _____

UNIVERSAL MOBILITY

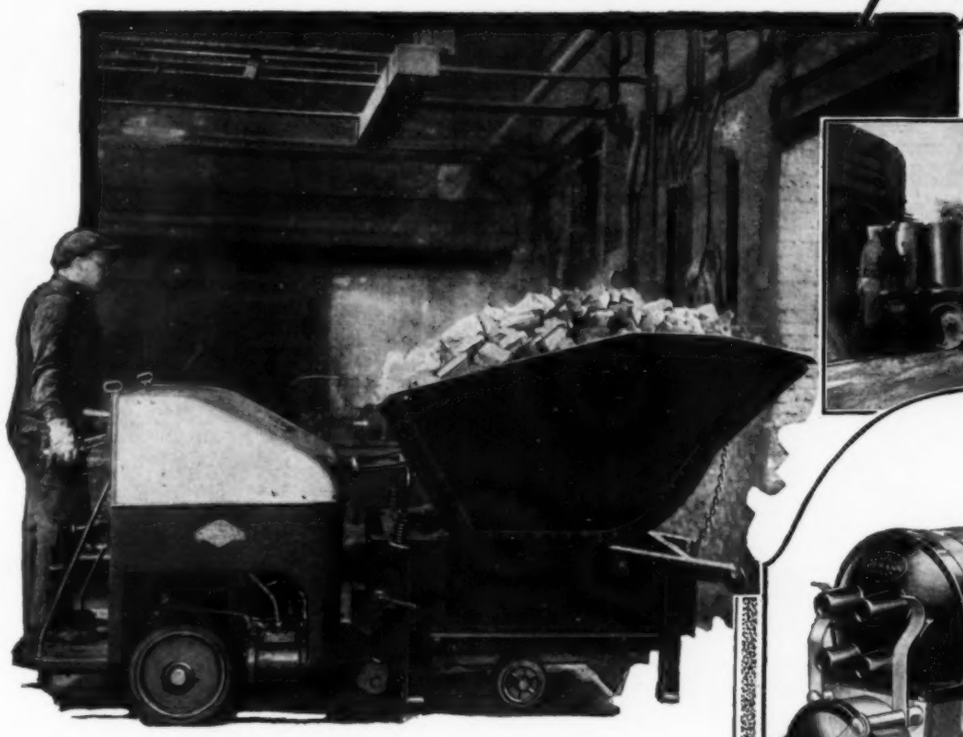
UNIVERSAL

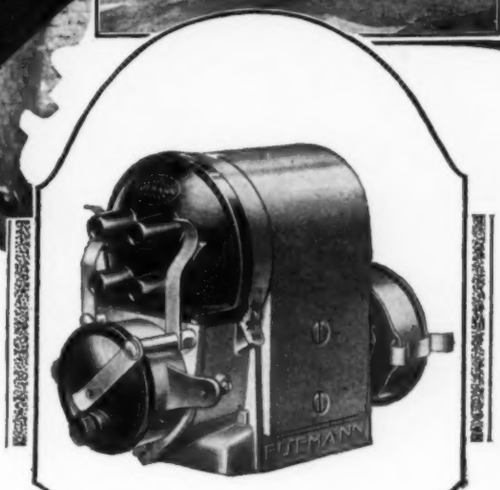
CRANES DRAGLINES SHOVELS TRENCH HOES

LARGEST and ONLY EXCLUSIVE BUILDERS of TRUCK CRANES

CLARK TRUCTRACTORS

~ are Eisemann Equipped!





THE ignition system on these sturdy, gasoline-powered industrial trucks is EISEMANN.

And not by chance or accident was EISEMANN selected.

The uses to which Clark Tructractors are put are as varied as the industries which they serve. But the object is always the same—labor-saving, and the resultant economies.

Reliable ignition is vitally important. A faulty, inferior magneto would offset the economies effected through this modern method of handling materials.

Clark Tructractors are built to operate 24 hours a day, if called upon to do so — and are equipped with magnetos equal to the task.

EISEMANN

EISEMANN MAGNETO CORPORATION ~ 165 BROADWAY ~ NEW YORK

The U.S. Navy Uses "ANTI-HYDRO"

All concrete floors and pits in the huge foundry building at the League Island Navy Yard are ***permanently*** waterproofed with "ANTI-HYDRO." This job is ten years old. It is built right on the waterfront. The concrete floors and pits are subjected to the most severe conditions, but "ANTI-HYDRO" has so thoroughly waterproofed and hardened the concrete that it is always dry and the floors never dusty.

In ***one*** operation and at ***one*** cost "ANTI-HYDRO" hardens, dustproofs and waterproofs concrete ***permanently***. For 16 years the United States Government has used "ANTI-HYDRO" in the Navy and other departments. Architects, engineers and builders everywhere use "ANTI-HYDRO" because of its economy and ***guaranteed*** results.

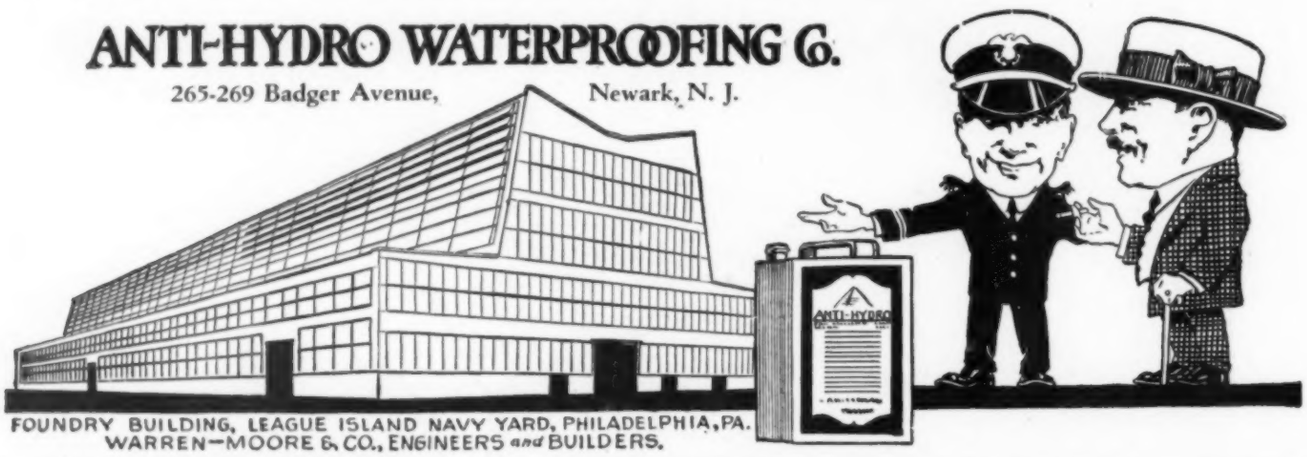
Because it is a liquid integral compound, "ANTI-HYDRO" is extremely easy to use. Simply mix it with the water used in wetting down concrete. That's all there is to it. Any unskilled laborer can do it. Saves finishers' time, too, because it accelerates the set of concrete and eliminates costly overtime work.

For 24 years "ANTI-HYDRO" has proved its reliability on every type of concrete hardening and waterproofing work. Use it on your next job for economy and ***guaranteed satisfaction.***

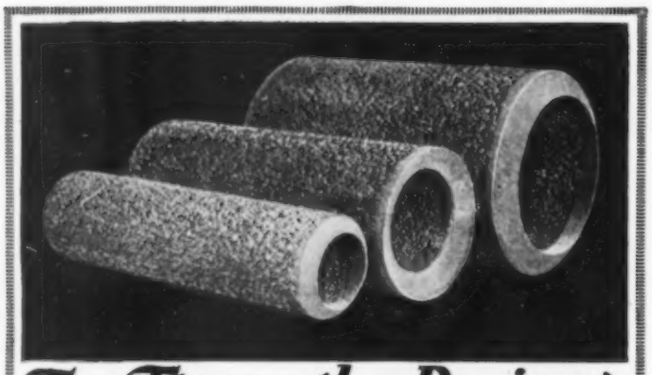
ANTI-HYDRO
FOR PERMANENT CONCRETE
HARDENS WATERPROOFS

ANTI-HYDRO WATERPROOFING Co.

265-269 Badger Avenue, Newark, N. J.



FOUNDRY BUILDING, LEAGUE ISLAND NAVY YARD, PHILADELPHIA, PA.
WARREN—MOORE & CO., ENGINEERS *and* BUILDERS.



Ten Times the Drainage Capacity of Other Pipes

"A FOOT OF DRAINAGE FOR EVERY FOOT OF PIPE"
Then Flows Through"
"The Water Seeps in and
"NO OPEN JOINTS"

Walker Cement Products, Inc.
Little Ferry N.J.
Plants at Little Ferry, N.J. & Baldwin L.I. N.Y.

WALKER POROSWALL
RAPID DRAIN PIPE

More Light for Less Money

Do you Investigate the Operating Costs of your Emergency Lighting? Some lights cost 6c. to 11c. an hour for 8000 Candlepower. The Milburn Furnishes 8000 Candlepower for only 3-1/3c. an hour.

Milburn Portable Carbide Lights are used by leading contractors who overlook no opportunity to make every saving that can be effected without sacrifice of efficiency.

Patented features, found only in Milburn Lights are responsible for these economies. Here are a few of these points:

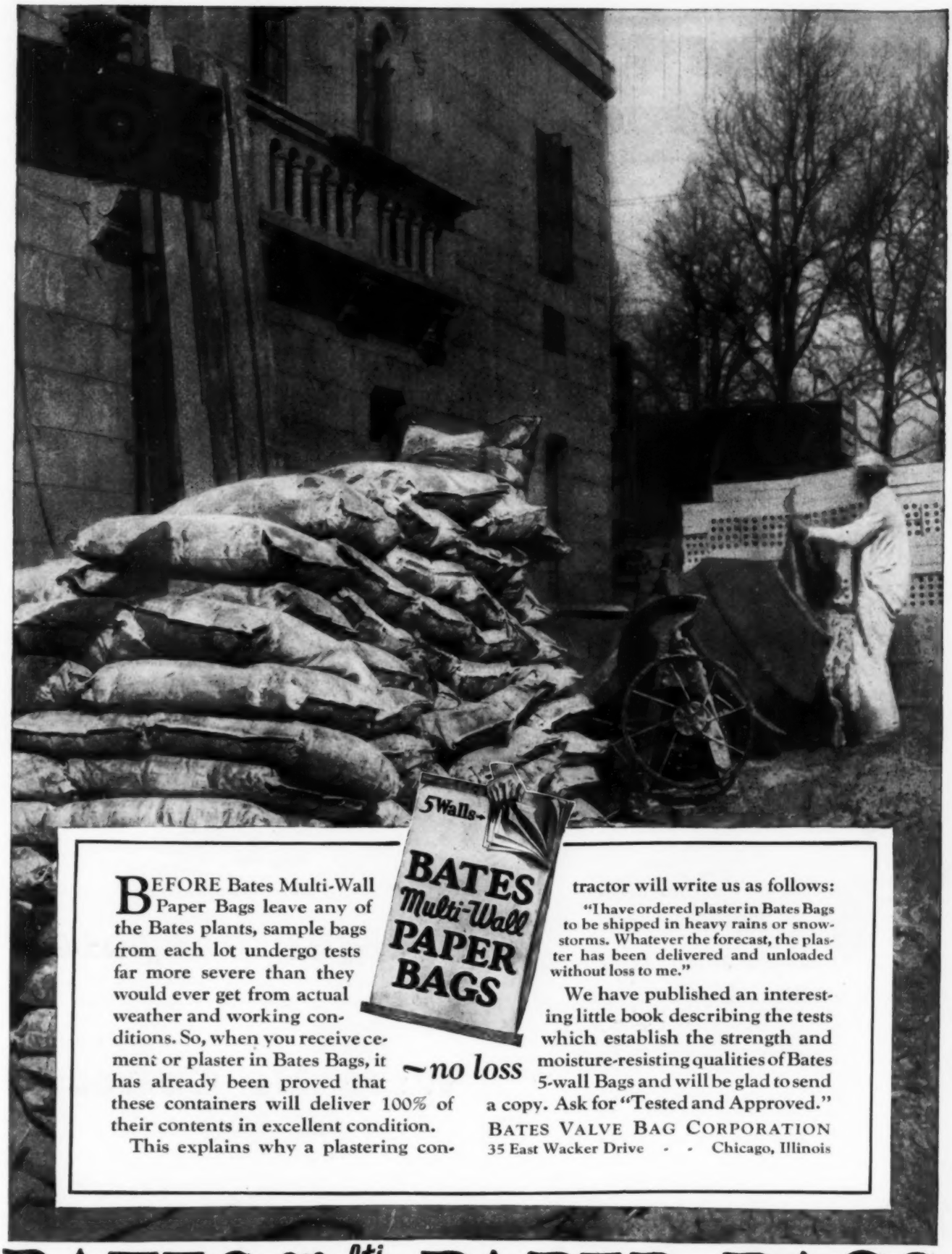
1. **THEY FURNISH 8,000 C.P. FOR ONLY 3 1/3c. AN HOUR.**
2. **They burn either commercial or cake carbide.**
3. **Light can be turned off for any period and relit WITHOUT LOSS OF CARBIDE.**
4. **They work absolutely automatically.**
5. **They do not require a change of water when recharging the light.**
6. **They are practically self-cleaning.**
7. **They cannot be overcharged.**
8. **They combine all the good points of other lights with numerous exclusive patented features found in no other lights.**

Let Milburn Carbide Lights save money for you too. Get full details.

Ask for Booklet No. 2499

THE ALEXANDER MILBURN COMPANY
1416-1428 W. Baltimore St. Baltimore, Md.

If interested in spray painting equipment or cutting and welding, ask for information on these subjects also



BEFORE Bates Multi-Wall Paper Bags leave any of the Bates plants, sample bags from each lot undergo tests far more severe than they would ever get from actual weather and working conditions. So, when you receive cement or plaster in Bates Bags, it has already been proved that these containers will deliver 100% of their contents in excellent condition.

This explains why a plastering contractor will write us as follows:

"I have ordered plaster in Bates Bags to be shipped in heavy rains or snowstorms. Whatever the forecast, the plaster has been delivered and unloaded without loss to me."

~no loss

We have published an interesting little book describing the tests which establish the strength and moisture-resisting qualities of Bates 5-wall Bags and will be glad to send a copy. Ask for "Tested and Approved."

BATES VALVE BAG CORPORATION
35 East Wacker Drive - - Chicago, Illinois

BATES *Multi-Wall* PAPER BAGS

Bates Multi-Wall Paper Bags are made by the Bates Valve Bag Corporation in 8 modern plants throughout the country

"Canned experience"

—make use of the other man's experience!

CHOOSE any of these McGraw-Hill Books that you would like to see. Read them for ten days free—keep those you want—send back those you don't want.

Pay for the books you keep as you use them. If you keep $15 worth of books, send $3.00 in ten days and $3.00 monthly.

The smallest monthly payment is $3.00

The monthly installments must be large enough so that the entire account will be paid in full within six months.

Prices are the same as cash—there is no extra charge for the monthly payment privilege.

That old saying— — —

about experience being the best teacher is absolutely sound in one sense. But most of us recite it without thinking that experience may be of various sorts—the experience of other men as well as our own, "canned experience," if you please, ready for use. Just open and serve yourself! Why not take advantage of the experience of other men as far as we can and save not only years of time but many expensive lessons?

Do you know how much of the world's best research in the construction field is contained in

McGRAW-HILL BOOKS?

That a single fact or table may be worth many times the price of the book to you?

Underwood—

STANDARD CONSTRUCTION METHODS

408 pages, 6x9, flexible, 330 illustrations, $5.00.

A manual of best methods in all phases of practical construction work for the use of construction superintendents and others upon whom rests the responsibility of getting construction jobs done quickly and efficiently.

Barnes—

ESTIMATING BUILDING COSTS

Second edition, 502 pages, 4½x7, flexible, $5.00

A thorough revision of this widely-known estimating handbook that aids the contractor and estimator in determining the amount of labor required for the various building operations, furnishes him with prices of labor and materials which will be useful in checking estimates.

Dingman—

ESTIMATING BUILDING COSTS

240 pages, pocket size, flexible, $2.50

A practical guide on estimating building construction costs.

Paul and Bennett—

METHODS AND PLANT FOR EXCAVATION AND EMBANKMENT

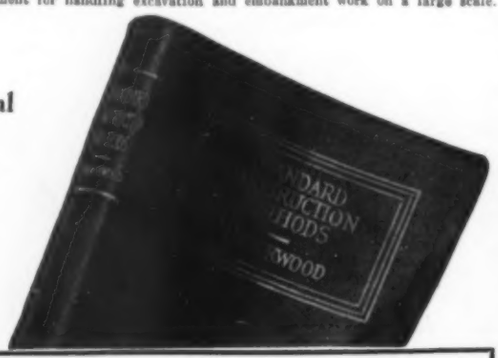
328 pages, 6x9, 109 illustrations, $4.00

A book that gives a detailed coverage to the most recent developments in ways, means, and equipment for handling excavation and embankment work on a large scale.

Sent on approval

No money down

Small monthly payments



McGRAW-HILL FREE EXAMINATION COUPON

McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York.

Send me the books checked for 10 days' free examination.

( ).....Underwood—Standard Construction Methods, $5.00.
( ).....Barnes—Estimating Building Costs, $5.00.
( ).....Dingman—Estimating Building Costs, $2.50.
( ).....Paul and Bennett—Methods and Plant for Excavation and Embankment, $4.00.

I agree to return such books as I do not wish to keep, postpaid, within 10 days of receipt, and to remit at the same time my first installment and the balance in equal installments each month, minimum monthly payments, I understand, are $3.00, and also that account is to be paid in full within six months.

Name .....
Home Address .....
City .....
Position .....
Name of Company..... C.M. 9-1-28

FULL PROTECTION

with the self-righting

TOLEDO TORCH

costs less than scant or doubtful protection by other means

Unbreakable
Reliable in Any Weather
Never Stolen
Uses Cheaper Fuel

$20.00
per dozen

Freight Prepaid

On all shipments of 1½ dozen or more
Prices slightly higher west of the Rockies

If your dealer does not have them

Wire Us Collect

We ship the same day we get your order

The Toledo Pressed Steel Company
12th St. and Woodruff Ave.
Toledo, Ohio

"Domestic" Drainage Systems

give

Safety, Speed and Profits

on jobs below the surface of water saturated soils

To lay pipe in water-soaked sand 18 ft. below water level is usually a difficult job—but—"Domestic" Pumps and Point drainage gave firm sides and dry bottom on this job.

Special Plunger Pump for "Point" Drainage

If interested in drying up specified areas in water-soaked soils our Bulletin No. 228 will interest you . . . It's Free.

DOMESTIC ENGINE & PUMP CO.
N. Queen St., and P. R. R.
SHIPPENSBURG, PENNA.

C.M. 9-28

Make use of McGRAW-HILL BOOKS

——they bring you the recorded experience of leaders in your field.

Send for our latest catalogue

Mail this coupon today!

McGRAW-HILL FREE CATALOGUE COUPON

McGraw-Hill Book Company, Inc.,
370 Seventh Ave., New York, N. Y.

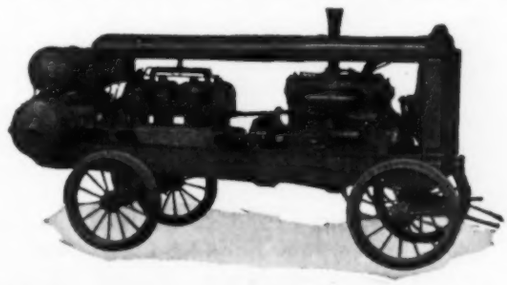
Send me the New 1927-28 McGraw-Hill Catalogue to the address given below. This catalogue is FREE, I understand.

Name .....

Address .....

City & State.....

PORTABLE AIR COMPRESSORS



360 cu. ft. size illustrated $3620 F.O.B. Factory

Furnished in sizes ranging from 15 to 360 cu. ft., both portable and stationary engine or motor drive, or truck and tractor mounting, "SCHRAMM" compressors cover all requirements of the field.

Conveniently located Stocks and Service

Schramm, Inc.
West Chester, Penna.

Offices and representatives in all important cities.

Schramm

Thousands say O.K. *for Compressed Air Work*

The O.K. Air Compressor gives the most air for your money on portable jobs and keeps the air tools working away all the time.

And the O.K. Air Compressor is powerful—a four-cylinder engine, with special device for idling when the load is cut off. There's a special O.K. clutch for starting the engine separately. A new type radiator, special valves—and other advantages which we'll tell you about if you'll write.

Some valuable territory still open to agents.

O.K. CLUTCH AND MACHINERY CO.
P. O. Box 305 Columbia, Pa.

THE FUNDOM

WORKS AT A PROFIT

THE Fundom always works at a profit. It's designed and built to save money on average sized and small jobs.

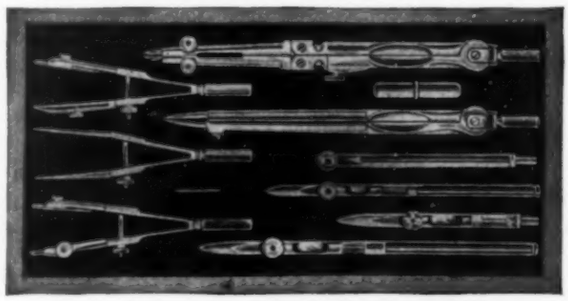
With 1/3 yard dipper capacity, ¾ full swing, radius of 16½ feet, unusual speed, sturdy construction, the Fundom makes money on every job.

With Boom Extension for clamshell, dragline or crane work, and Trench Hoe Attachment for ditching, the versatility of the Fundom is apparent.

You owe it to yourself to investigate the profit-making possibilities of the Fundom. Get the details and name of nearest dealer. Address—

The Fundom Hoist & Shovel Co.
407 American Bank Building, Lima, Ohio

This splendid set of SOELLNER Drawing Instruments



Set No. 1894

is made of rolled German Silver and best English Steel. It is very attractive in appearance and of superior workmanship throughout.

It Contains

3—3½" Bows
2—Ruling Pens
1—6" Compass with attachments
1—6" Divider

$6

Complete, in velvet lined case, postage paid.

KOLESCH & CO.
138 Fulton St., New York
Established 1885

You Can Prevent Concrete Failures

Frequent compression tests are not only now required on all large contracts, but are absolutely essential from a standpoint of safety.

The illustration shows one of our 100-ton hydraulic presses arranged especially to test concrete test cubes, cement, stone, etc.

When it is desired to check and calibrate the gauge load readings, a variable pressure accumulator (of known increments) is furnished.

Write for Bulletin B-18X

THE WATSON-STILLMAN CO.
1014 Evening Post Bldg., New York City

Chicago, 549 W. Washington Blvd. Philadelphia, Widener Bldg.
Cleveland, Auditorium Garage Bldg. Detroit, 7752 Dubois St.

Speed Plus Economy!

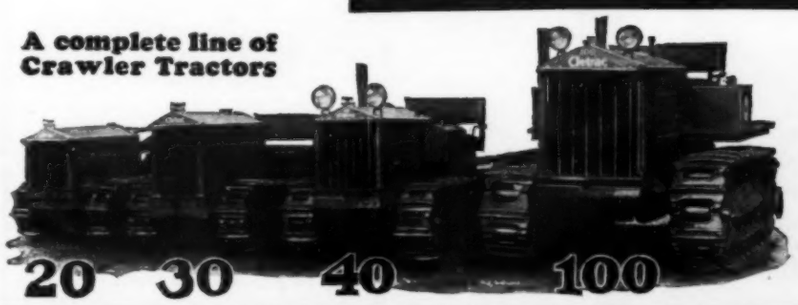
WHETHER it is road-building, road-maintenance, excavating, earth moving — no matter how heavy the job or how difficult the conditions — you can bank on this fact: A Cletrac Crawler Tractor will speed up your work, cut down your costs and give you the most profitable service ever rendered by any tractor.

In annually increasing thousands Cletracs are replacing less efficient power units for all types of industrial work. Their greater draw-bar power and sure traction — their all-year utility — their distinctive features of "One-Shot" instant oiling, short turning, easy control, lower maintenance and operating costs — these are some of the incomparable qualities that place Cletracs foremost in industrial work today.

Within Cletrac's complete line you are assured of finding a size of power unit which will most economically and profitably meet the requirements of your work. Let us send you full details.

The Cleveland Tractor Co., Cleveland, Ohio

A complete line of Crawler Tractors



THE CLEVELAND TRACTOR CO.
Cleveland, Ohio C.M.

Send literature regarding CLETRACS for highway and industrial work.

Name _____

Address _____

_____

5 yards in 5 minutes!

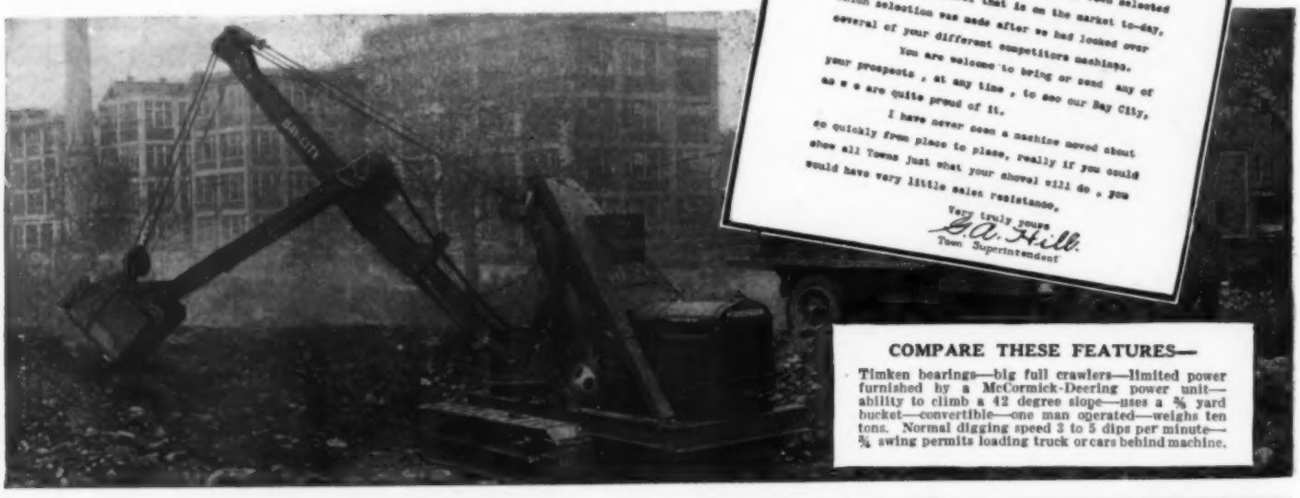
If you want your excavating and loading work done in record time—and every one does—then you should look over the Bay City—and every one is!

Such letters as the one reproduced on the right are typical. Here a Bay City is being used to clear a space for a rock crusher as well as for loading. The material handled is heavy gravel over 80% stone.

If you want details on this fastest operating convertible machine built—write today.

BAY CITY DREDGE WORKS

BAY CITY : : : : : : : MICHIGAN



G.A. HILL, TOWN SUPT

CANAJOHARIE, N.

TOWN of CANAJOHARIE
MONTGOMERY CO., N.Y.

June 18, 1928.

Bay City Dredge Works,
308 Broadway,
New York City.

Gentlemen:-

Att. of Mr. Eugene P. Reading.

I am pleased to report that the BAY CITY TRACTOR SHOVEL which w e purchased from you has been most satisfactory for our work and is well liked by all.

We have loaded 5 yards on our trucks in less than 5 minutes.

I certa inly feel that our Town selected the best small shovel that is on the market to-day, which selection was made after we had looked over several of your different competitors machines.

You are welcome to bring or send any of your prospects , at any time , to see our Bay City, as w e are quite proud of it.

I have never seen a machine moved about so quickly from place to place, really if you could show all Towns just what your shovel will do , you would have very little sales resistance.

Very truly yours
G.A. Hill.
Town Superintendent

COMPARE THESE FEATURES—

Timken bearings—big full crawlers—limited power furnished by a McCormick-Deering power unit—ability to climb a 42 degree slope—uses a ¾ yard bucket—convertible—one man operated—weighs ten tons. Normal digging speed 3 to 5 dips per minute—¾ swing permits loading truck or cars behind machine.

A Rogers Saved $400 On One Move

"It saved me $400 on one move," said a man speaking of a Rogers.

Many contractors can profitably employ Rogers Heavy Duty "Gooseneck" Trailers to move heavy equipment quickly and economically.

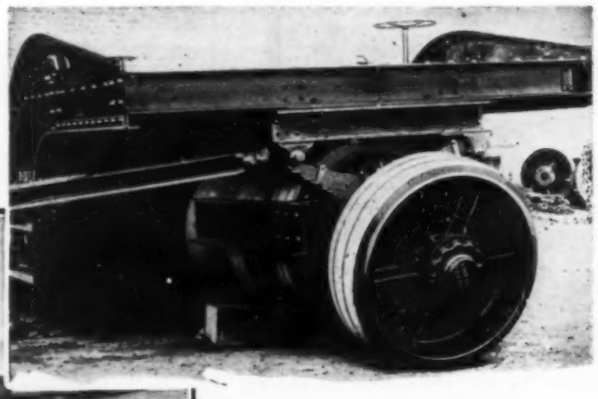
Their remarkable roadability results from their short turning radius, more than 90 degrees, and the rocking axles with 8 inches oscillation that level out uneven roads.

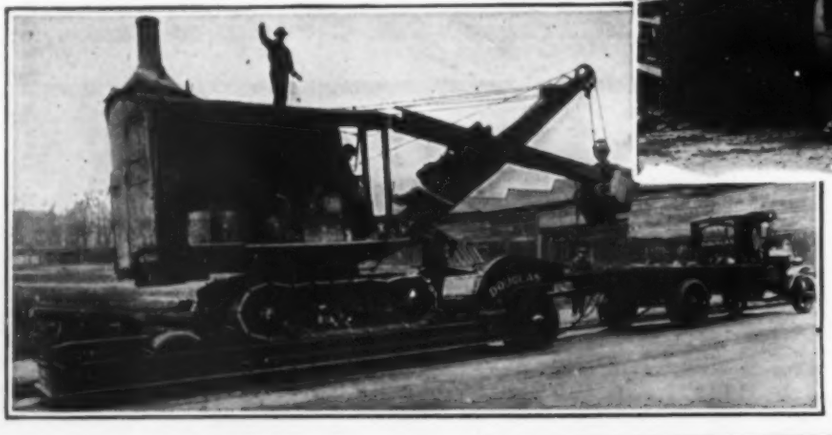
The ease with which Rogers Trailers load is striking, and their distinctive design makes possible unusually quick transportation.

Write for the Rogers story. Find out how utilizing Rogers Heavy Duty Trailers will save you money.

ROGERS BROTHERS CORPORATION

ALBION, PA.





Above—Note spring mounting, 90° turning radius for short turns and oscillation of inside front wheels.

Left—This shovel was loaded, ready to go, in one minute.

Showing Jamaica a new kind of ginger

ON THE island of Jamaica, this Hayward Orange Peel Bucket is showing a new kind of ginger. Digging fast and powerfully. Grabbing big loads in hard-packed earth, in muck and in mire. Working among obstinate stumps and dense tropical vegetation. Fighting the age-old supremacy of the jungle.

Engineers the world over assign tough jobs to Hayward Buckets because they know what to expect of them. They know that a Hayward has the power and the speed to wade right into a tough assignment and get it out of the way in short order. They know that its strong construction enables it to stand up under the strains, and insure long-term service.

Let us send you bulletin 655, which describes and illustrates various types of Hayward Orange Peel Buckets.

Builders of Clam Shell, Orange Peel, Drag Line and Electric Motor Buckets; Dredging, Excavating and Coal Handling Machinery, Automatic Take - Up Reels; Counterweight drums.

THE HAYWARD COMPANY
44 Dey St., New York, N. Y.

Hayward Buckets

They Stand the Gaff

Marsh-Capron *Concrete Mixers*

Look at the names on those old mixers you see still doing duty on all kinds of jobs. You'll find a good percentage of them Marsh-Caprons. Take the 10S shown above—here is a mixer that will deliver full 10 cu. ft. of mixed concrete at each batch—you don't have to overlook it to get this capacity. A large size mixer, yet easy to move and one that comes on the job—ready to go to work—a mixer that stands the gaff of steady pouring day in and day out—a mixer with Power Loader—Batch Hopper—or Low Charging Platform easily interchangeable right on the job.

Know the Marsh-Caprons before Selecting any other Mixer Their modern features and long record of performance—over 20 years of success in the mixer field—will interest you.

Construction Machinery Company

MARSH-CAPRON *Division*
448 Vinton
Waterloo, Iowa

Mail This

Construction Machinery Co.
448 Vinton, Waterloo, Iowa
Send me details on Marsh-Capron:

.....Type and Size of Mixers

Name.....

Street.....

City.....

GET NEW LOW PRICES!

HIGHEST QUALITY CONSTRUCTION EVER USED

Amazing factors of strength and efficiency. Compare the BOSS Drum with the mixing drum of any outfit within $250 of its price. All steel, electrically welded, leak proof; 800-lb. less dead load for engine. Steel castings and forgings where strain is great. Hyatt Bearings save power and oil. Massive semi-steel gears. Alemite lubrication. Learn all the BOSS means to you.

High Speed Mixing and Discharge

Patented re-mixing action produces exceptionally strong, uniform aggregate—10 cu. ft. per batch. Finger touch discharge action—8 to 12 seconds. 10-12 h.p. multicylinder Novo and LeRoi engines. A fast-working, dependable outfit at a price that's RIGHT. Easy To Buy.

THE BOSS
ONE-TWO BAGGER
MIXER

Act NOW!

Look into this. Write today for money-saving facts and prices.

BOSS Mixers are built in all sizes and types.

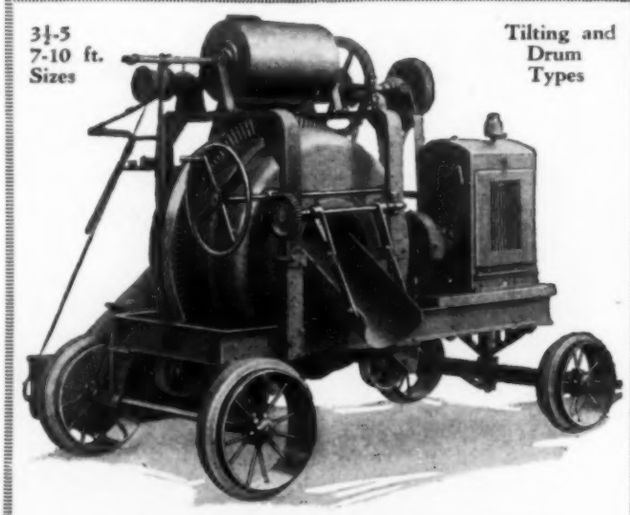
BOSS Hoists—Single and Double Drum.

Write Today!

AMERICAN CEMENT MACHINE CO., Inc.
245 South Fourth Street KEOKUK, IOWA

3½-5
7-10 ft.
Sizes

Tilting and
Drum
Types



CATALOGS NOW READY ON THE NEW

REPUBLIC
Roller Bearing Mixers

New Features and Improvements

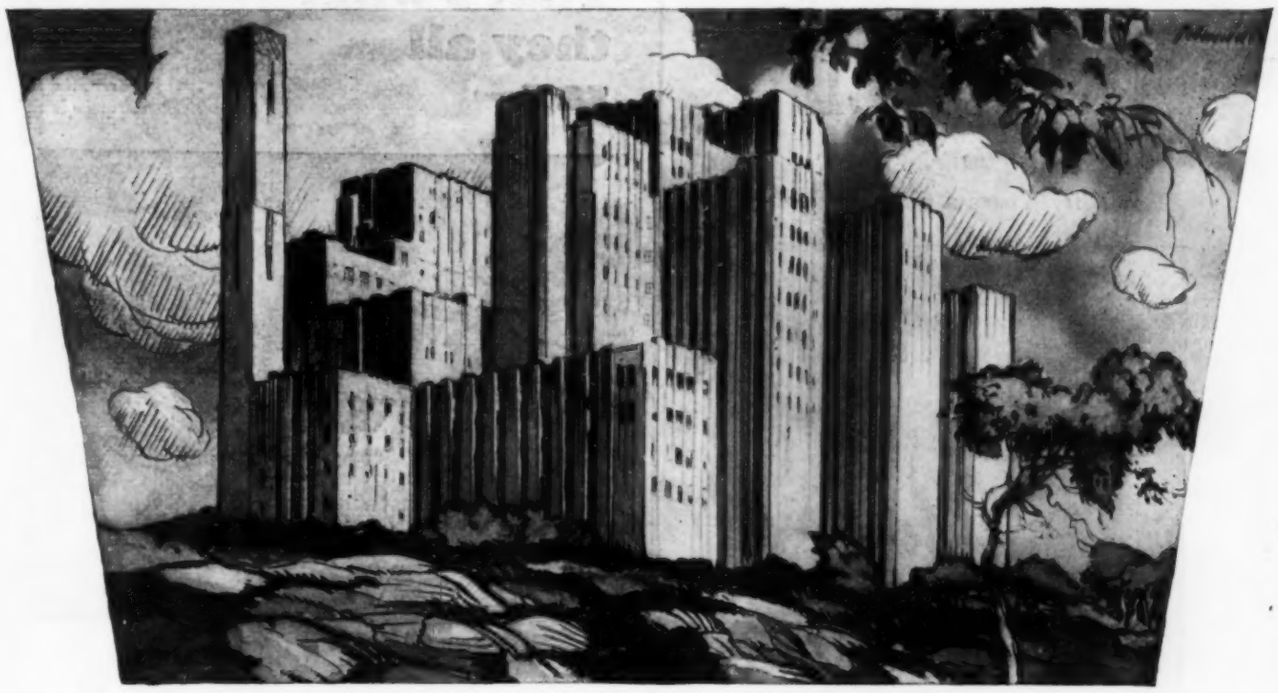
All Money Savers

Roller Bearings throughout—heavier drum, trucks, frame and wheels—simplified construction—quicker mix and discharge—easier cleaning.

Write for Catalog

Republic Iron Works
Tecumseh, Mich.

DEPENDABILITY *and* PERMANENCE . . *The True Measure of Quality in Portland Cement*



MORE than a decade of experience advised what portland cement should be used for the Columbia-Presbyterian Medical Center, completed this year, in New York. ¶In 1916, the same architects, James Gamble Rogers, and the same contractors, Marc Eidlitz & Son, Inc., selected Atlas Portland Cement for the Harkness Memorial Quadrangle of Yale University. The work on this great structure and the intervening years proved the dependability and permanence of Atlas. It was chosen again. ¶The record of Atlas is replete with similar repeated choice for small jobs and mighty projects. Architects, engineers, and contractors, using it once, specify it again and again. And this is a prime reason why Atlas is known as "The Standard by which all other makes are measured."

Your clients will see the foregoing message this month in color pages appearing in an impressive list of national magazines. This is the public's complete confidence won and prestige increased for the contractor who uses Atlas Portland Cement. The Atlas Portland Cement Company, 25 Broadway, New York City.

ATLAS PORTLAND CEMENT GRAY & WHITE

Main Offices: New York — St. Louis

NEW YORK • ST. LOUIS • CHICAGO • BIRMINGHAM • KANSAS CITY • PHILADELPHIA • BOSTON • DES MOINES • OKLAHOMA CITY • OMAHA • ALBANY

In 1916, Atlas was selected for the Harkness Memorial Quadrangle of Yale University (at right). 40,000 barrels were used. When the same architects and contractors built the Columbia-Presbyterian Medical Center (above), completed this year in New York, they chose Atlas again. Over 125,000 barrels were used. More than a decade of experience merited this repeated choice.

A vastly enlarged range of artistic possibilities is given to concrete by Atlas WHITE, perfected by The Atlas Portland Cement Company. A true portland cement, white in color, it has all the famed qualities of Atlas GRAY Portland Cement — high tensile strength, permanence, economy. It invites architects to plan varieties of color, to choose from widely varied surface textures, and to specify even decorative sculpture of concrete.

IT'S NOT IN THE NAME

LOWELL

It's in the Wrench

For Fifty Years a Quality Tool

FOR SPEED FOR ECONOMY

Both in Operation and Service

There is no better Ratchet Wrench than the

LOWELL

Its Savings in Time and Money Increase

Your Profits

The Ratchet Wrench is replacing the Monkey and Engineers' Wrenches.

Have You Investigated Its Possibilities?

DO IT NOW

LOWELL WRENCH COMPANY
54 Commercial Street
WORCESTER, MASS., U. S. A.

Tear out this coupon on dotted line above, write your name and address below, put it in an addressed envelope and let Uncle Sam and us do the rest.

Send Catalog M.

Name .....

Address .....

City ..... State.....

Company .....

That's what they all say—

"WE ARE using it side by side with larger pumps . . . and the others suffer in comparison."

Hardaway Contracting Co.,
Johnsonville, Tenn.

The Homelite Portable Centrifugal Pump referred to by Hardaway is no exception. Results always surprise the new user. Why not?

7500 gal. per hour

with an engine and pump weighing only 95 lb. - - - and husky construction at that. And it costs only $225 f.o.b. factory.

Thousands working in all parts of the world. Seeing is believing. Ask for name of nearby distributor who will demonstrate Homelite on your job.

HOMELITE CORPORATION, Port Chester, N.Y.
Ditributors in principal cities throughout the world.

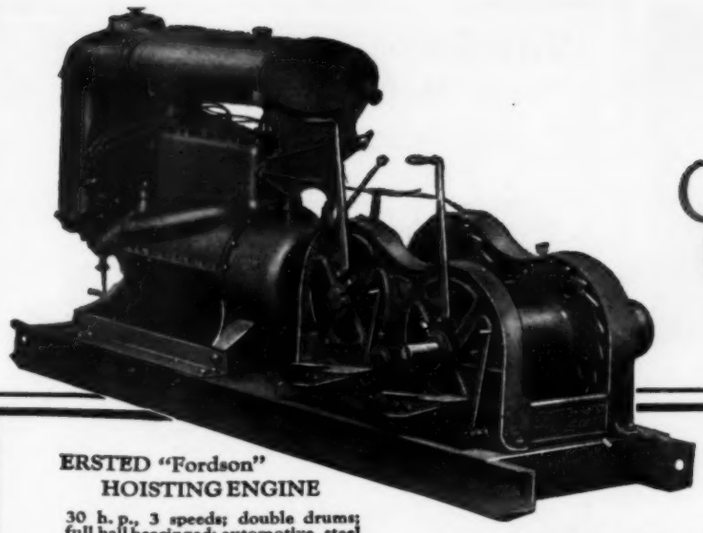
See our exhibit at the Good Roads Show, Cleveland, Jan. 14-18

Homelite

Portable Centrifugal Pump

2784

ERSTED Automotive 3 SPEED HOISTS BALL BEARINGED



ERSTED "Fordson" HOISTING ENGINE

30 h. p., 3 speeds; double drums; full ball bearinged; automotive, steel construction; capacity to 5000 lbs.; weighs only 2400 lbs!

DISTRIBUTORS

BALTIMORE, MD.
Henry H. Meyer Company
BOSTON, MASS.
Clark-Wilcox Co., Inc.
BUFFALO, N. Y.
Wheeler-Murray Company
CHICAGO, ILL.
Western Contractors Sup. Co.
CLEVELAND, OHIO
W. M. Pattison Supply Co.
DALLAS, TEXAS
Browning-Ferris Machy. Co.
DENVER, COLO.
H. W. Moore Equipment Co.
DES MOINES, IOWA
Herman M. Brown Company
DETROIT, MICH.
W. H. Anderson Tl. & Sup. Co.
EL PASO, TEXAS
Steel Products Corporation
GRAND RAPIDS, MICH.
W. H. Anderson Tl. & Sup. Co.
HOUSTON, TEXAS
Browning-Ferris Machy. Co.
INDIANAPOLIS, IND.
W. J. Holliday & Co.
KANSAS CITY, MO.
Newlin Motor Company
LOS ANGELES, CAL.
Harron, Rickard & McCone Co.
MILWAUKEE, WIS.
Cunningham-Ortmayer Co.
MINNEAPOLIS, MINN.
Thorman W. Rosholt Co.
NEW ORLEANS, LA.
Woodward-Wight & Co., Ltd.
NEW YORK CITY, N. Y.
Mott & McElrath Eng. Corp.
OKLAHOMA CITY, OKLA.
Wylie Bros., Inc.
OMAHA, NEB.
Herman M. Brown Company
PHILADELPHIA, PA.
Mott & McElrath Eng. Corp.
PITTSBURGH, PA.
Geo. W. Ziegler Machy. Co.
PORTLAND, OREGON
Howard-Cooper Corporation
SALT LAKE CITY, UTAH
Landes & Co.
SAN FRANCISCO, CAL.
Harron, Rickard & McCone Co.
SEATTLE, WASH.
A. H. Cox & Co., Inc.
SPOKANE, WASH.
Hoflus-Ferris Equipment Co.
VANCOUVER, B. C.
National Machinery Co., Ltd.
WASHINGTON, D. C.
Henry H. Meyer Company

WORTH MORE *than Ordinary Hoists!*

COST *LESS* *than Ordinary Hoists!*

ERSTED engineers, first to adapt automotive engineering practices, automotive materials and automotive methods of standardized quantity production to the manufacture of hoisting machinery, left the beaten path and inaugurated a new era in a field in which little progress had been made for twenty years.

Ersted "Automotive" Hoists and Cranes are termed "Automotive" to differentiate them from ordinary hoisting machines. Built into them are capacity and strength, serviceability and efficiency impossible to achieve with ordinary materials and construction. Correct design, superior materials and workmanship combine to make these the most serviceable hoisting machines ever produced; low prices made possible by modern manufacturing methods; the best values ever produced.

More than 5000 Ersted hoist users the world over are testimonial of Ersted acceptance and performance.

Write today for catalog

ERSTED MANUFACTURING CO.
PORTLAND OREGON, U. S. A.

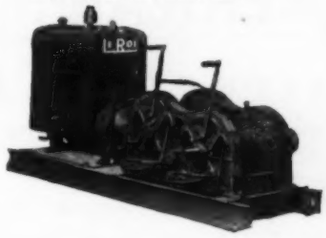
ERSTED *"Automotive"* CRANE

3 speeds; full ball bearinged; automotive, steel construction; for truck or stationary mounting. Capacity, ½ yd. clamshell bucket. *Worth more, cost less than ordinary cranes!*

Write for catalog

ERSTED "Le Roi" HOISTING ENGINE

20 h. p.; 3 speeds, double drum; full ball bearinged; automotive, steel construction; capacity to 5000 lbs; weighs only 2000 lbs!



1

They're Automatically Primed

with a Type and Size for Every Pumping Job

Type MEP Centrifugal Pump—Automatically Primed. Furnished complete including LeRoi engine. Built to stand the gaff of continuous service, yet light weight. Six sizes; capacities to 1,200 gals. per min.; suction lifts to 20 ft. Low priced.

Barton Centrifugal Pump — Automatically primed. Attaches to front of any car or truck and automobile engine drives it. Dependable; light weight; does not interfere with driving. Five sizes; capacities to 900 gals. per min.; suction lifts to 20 ft. Low priced.

TODAY contractors the country over are saving time, eliminating grief with American-Marsh Pumps. The patented Automatic Primer furnished without extra cost on every one of these pumps is a sure-fire device that always functions. In less than one minute you're handling water —no attention required—no idle crews—no $3 to $5 per day for a man to watch pumping operations.

Turn to American-Marsh and cut your pumping costs! Use coupon below, checking as interested.

AMERICAN-MARSH

Contractors Pumps

AMERICAN STEAM PUMP COMPANY
BATTLE CREEK, MICHIGAN.

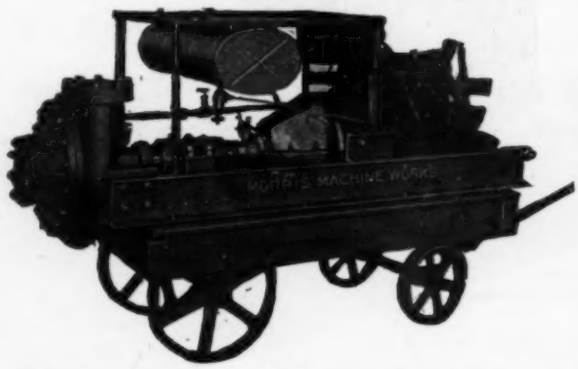
☐Send Bulletin 59 on Type MEP Pumps.

☐Send Bulletin 56 on Barton Pumps.

Name .....

Address .....

To make your unwatering and water supply problems easier!



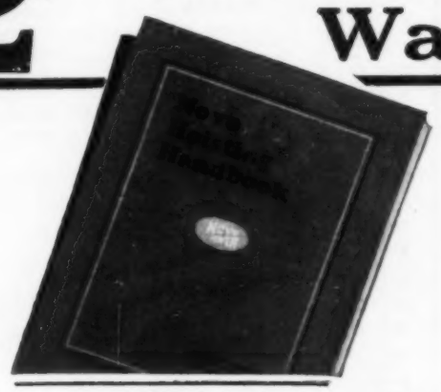
THIS Morris Portable All-Purpose Pump handles anything from clear water to floating dirt, sand and gravel, delivers 300 to 600 gals. per min., can be used for heads up to 50 ft., and is easy to cart from one job to another. For general water supply, unwatering excavations, sumps, etc., it can't be beat.

Write for literature about this and other sizes of Morris Pumps

MORRIS MACHINE WORKS, Baldwinsville, N.Y.

MORRIS
CENTRIFUGAL PUMPS

2¢ Show the Way



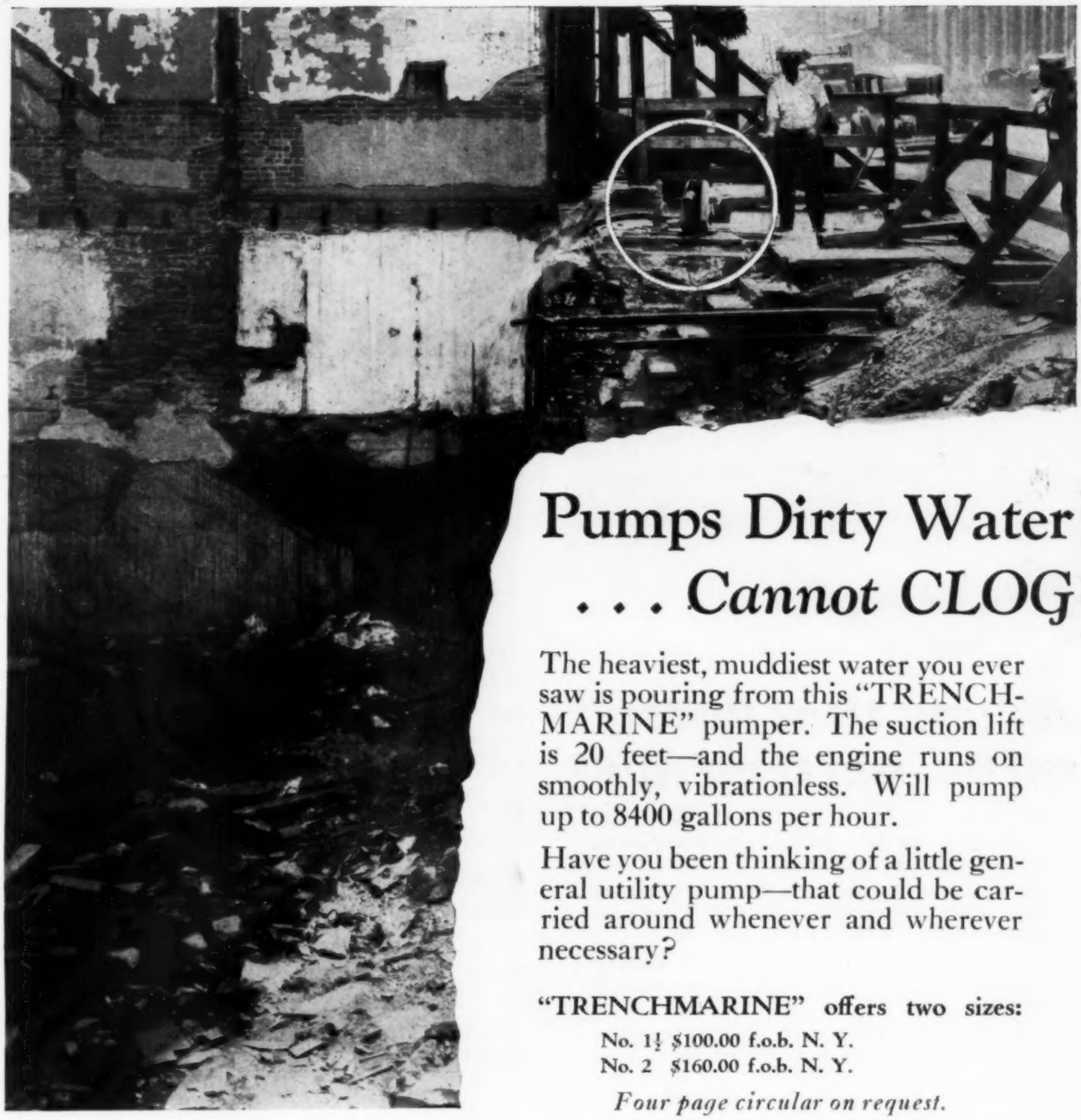
to Lower Hoisting Costs

This booklet is a collection of hoisting jobs from all over the country—on all types of work. Given in detail by pictures, facts and figures—theypoint the way to better, cheaper hoisting methods. Send for your copy today—no obligation.

NOVO ENGINE COMPANY, 214 Porter Street LANSING, MICHIGAN

NOVO

Clarence E. Bement — Vice-Pres.&Gen.Mgr.



Pumps Dirty Water . . . *Cannot* CLOG

The heaviest, muddiest water you ever saw is pouring from this "TRENCHMARINE" pumper. The suction lift is 20 feet—and the engine runs on smoothly, vibrationless. Will pump up to 8400 gallons per hour.

Have you been thinking of a little general utility pump—that could be carried around whenever and wherever necessary?

"TRENCHMARINE" offers two sizes:

No. 1½ $100.00 f.o.b. N. Y.
No. 2 $160.00 f.o.b. N. Y.

Four page circular on request.

WHY "TRENCHMARINE" PORTABLE CENTRIFUGAL PUMPING UNITS ARE IN GREAT DEMAND

1. They are self-contained — always ready for action.
2. Compact and light—easily transported—but not too light for hard work.
3. Capacities up to 8400 gallons per hour.
4. All parts easily accessible.

LOW FIRST COST

5. Air cooled—cannot freeze in cold weather—Runs cool in hot weather.
6. Four cycle engine—High tension magneto.
7. Open impeller pump—cannot clog.
8. Simple enough for any laborer to operate.

LOW OPERATING COST

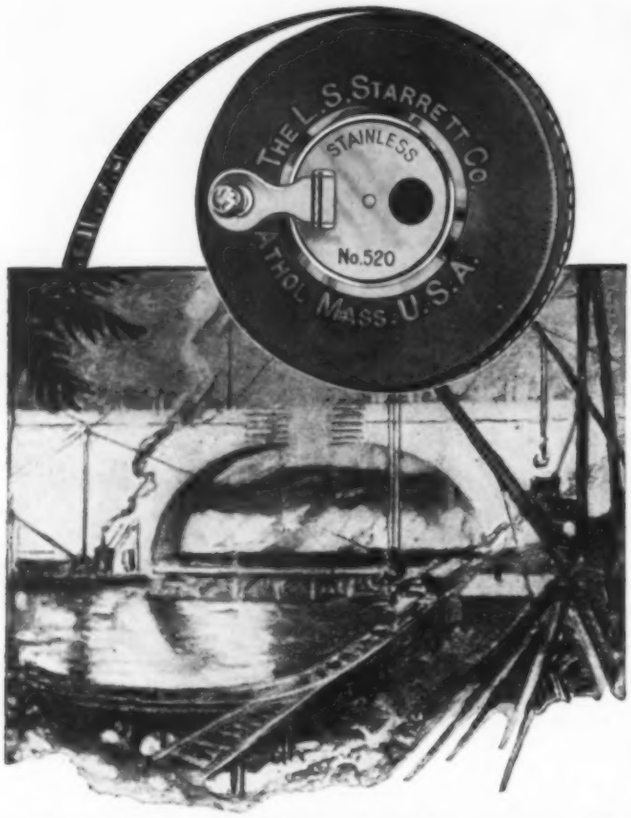
Write for Distributors Proposition.

CABLE ADDRESS
TRENCHPUMP, N. Y.

TRENCH & MARINE PUMP CO.

85 WARREN STREET, NEW YORK, N. Y.

MAKERS OF PUMPS
THAT PUMP



A tape that doesn't mind getting wet

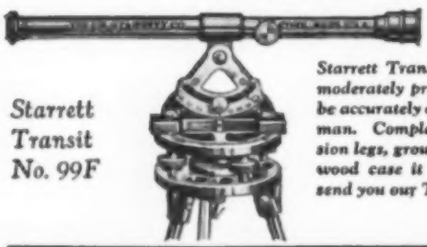
The Starrett Stainless Steel Tape is designed particularly for jobs around the water or in damp ditches or tunnels.

Made of genuine Stainless Steel, this Starrett Tape never needs scouring for it does not rust, consequently it always looks like new.

A quick run of the ribbon through a cloth to remove any mud or grit is all the attention it ever requires.

Your dealer has the Starrett No. 521 Stainless Steel Tape graduated in feet, tenths and hundredths of a foot; and the No. 520 Tape with feet, inches and eighths of an inch graduations. Both come in 50 and 100 feet lengths. Write us for the new Starrett Catalog No. 24"NF."

THE L. S. STARRETT CO.
World's Greatest Toolmakers
Manufacturers of Hacksaws Unexcelled
Steel Tapes—Standard for Accuracy
ATHOL, MASS., U.S.A.



Starrett Transit No. 99F

Starrett Transit No. 99F is a simple, moderately priced instrument that can be accurately operated by any practical man. Complete with telescope, extension legs, ground level vial and handy wood case it costs only $40. Let us send you our Transit Book.

Use Starrett Tools

2051

Cleveland A1 Drill

Built

To run on low air consumption, the Cleveland A1 Drill is especially efficient where it is difficult to obtain high pressure. Yet its drilling and hole cleaning ability is under all pressures exceptional.

With its efficient oiling system, its powerful rotation, and its ample hammer blow, the A1 delivers a startling amount of useful work.

The Cleveland Rock Drill Co.
3734 E. 78th St.,
Cleveland, Ohio

Branches, Agents, Service Stations in Principal Cities of the World

Specifications of Cleveland Drills on pages 150-151, Keystone Metal Quarry Catalog.

The Cleveland H7 SINKER with power beyond your dreams and stamina heretofore unknown, does work that other sinkers won't touch.

It's the fastest drill you ever used, and on any job where the going is tough, the H7 is in a class by itself.

See it in action. Write for demonstration.

CLEVELAND ROCK DRILLS

JOBS

and

men to fill them

POSITIONS WANTED

Superintendents

ASSSTIANT superintendent and general carpenter foreman. Thoroughly experienced in all lines of building and concrete bridge construction. PW-68, Construction Methods, Tenth Ave. at 36th St., New York.

MAIN line railroad supervisor, age 41, college graduate, 18 years with same company in construction and maintenance of tracks and structures, now in charge of 450 men, desires permanent position with reliable contractor. PW-66, Construction Methods, Tenth Ave. at 36th St., New York.

SUPERINTENDENT of construction; over twenty years' experience, large and varied; managing and supervising erection of all types of building construction and operations; familiar with modern equipment and methods; now available. PW-67, Construction Methods, Tenth Ave. at 36th St., New York.

SEARCHLIGHT SECTION

Construction Methods

TENTH AVENUE AT 36TH ST., NEW YORK

ADVERTISING RATES

UNDISPLAYED—RATE PER WORD:

Positions Wanted, 6 cents a word, minimum $1.25 an insertion, payable in advance.

Positions Vacant and all other classifications, 10 cents a word, minimum charge $2.00.

Proposals, 50 cents a line an insertion.

DISPLAYED—RATE PER INCH:

1 to 3 inches.....$7.50 an inch
4 to 7 inches..... 7.25 an inch
8 to 11 inches..... 7.00 an inch

An advertising inch is measured vertically on one column, 3 columns—30 inches—to a page.

INFORMATION:

Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.

Discount of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

POSITIONS WANTED

Miscellaneous

ENGINEER, inspection and supervision bridge and general construction; at present with large corporation; single, dependable; references; several years in Orient; available short notice. PW-65, Construction Methods, 7 So. Dearborn St., Chicago, Ill.

GENERAL or carpenter foreman, 25 years' experience in all lines of buildings, foundations and concrete construction. PW-69, Construction Methods, Tenth Ave. at 36th St., New York.

MAN thoroughly experienced in road construction and maintenance, desires position as foreman or superintendent; prefer West Virginia or southern Ohio. Address Engineer, 373 Dorr St., Toledo, Ohio.

Is There A Blast Furnace Near You?

CERTAINLY there's a market for scrap iron — steel plants buy it. But why let that old hoist, sinker pump, station pump, boiler, or other machinery that is not in use rust out and become scrap?

Advertise it for sale. You know its worth; tell others. There's someone who needs just that kind of equipment and SEARCHLIGHT can find him for you. Write for information

To

SEARCHLIGHT DEPARTMENT
10th Ave. at 36th St., New York

Rebuilt and Guaranteed

Partial List Pumps and Compressors

Air Compressors—Belted

24x16 in. Bury.
12x12 in. Laidlaw-Dunn-Gordon.
10x10 in. Ingersoll-Rand.
9x9 in. Curtiss Duplex.
6x6 in. Chicago, Model G.S.B.

Air Compressors—Steam

7x8x8 in. Marsh.
4x3x6 in. American.
4x3x5 in. Union.

Centrifugal Pumps

2—10 in. Allis-Chalmers.
1—10 in. Special.

Steam Pumps

9x7x12 in. Worthington Duplex.
7½x4 in. Laidlaw-Dunn-Gordon-Duplex.
4½x8 in. Deming Triplex.
8x5x8 in. American.
7½x7x7½ in. National.

Also All Kinds of Metal Working Machine Tools, Approximately 3,000 to Choose From

Riverside Machinery Depot

The Used Machinery House

251 St. Aubin Ave., Detroit, Mich.

Why buy wood sheeting?

You can save money by renting Steel Sheet-Piling from Wemlinger, Inc.—and do a more satisfactory job.

We maintain stocks of Steel Sheet-Piling throughout the country, for sale or for rent.

Wemlinger, Inc.
149 Broadway, New York

STEEL SHEET PILING

LINDHEIMER — SUCCESSFUL PERFORMANCE GOLFAGC-AEC — SERVICE

Saves you money and trouble in Foundation, Cofferdam, and Sewer work.

Bought-Sold-Rented—Always carried in stock

LONG DISTANCE TELEPHONE: CENTRAL 0491

S·W·LINDHEIMER

31 South Clark St. CHICAGO

Equipment For Sale

at Fort Pierce, Florida

Used on one job.

1—7s Leach Gas Mixer No. 185.
1—H-P Gas Grader.
1—2000 yard Portable Warren Asphalt Plant.
1—8 ton Tandem Buffalo Springfield Roller No. 13338.
Small Tools and Repair Parts.

Address: SIEMS, HELMERS & SCHAFFNER, INC.
1014 Guardian Building, St. Paul, Minn.

Largest Stock of Used Surveying Instruments in this Country

Satisfaction guaranteed or money refunded. Write for complete list and catalog of our high grade instruments and supplies for civil engineers, surveyors, mining, builders, contractors, etc.; 40 years' experience in repairing instruments of all makes at reasonable prices. Prompt service.

WISSLER INSTRUMENT CO.
615 N. Broadway, St. Louis, Mo.

If you don't find

—the man
—the job
—the equipment

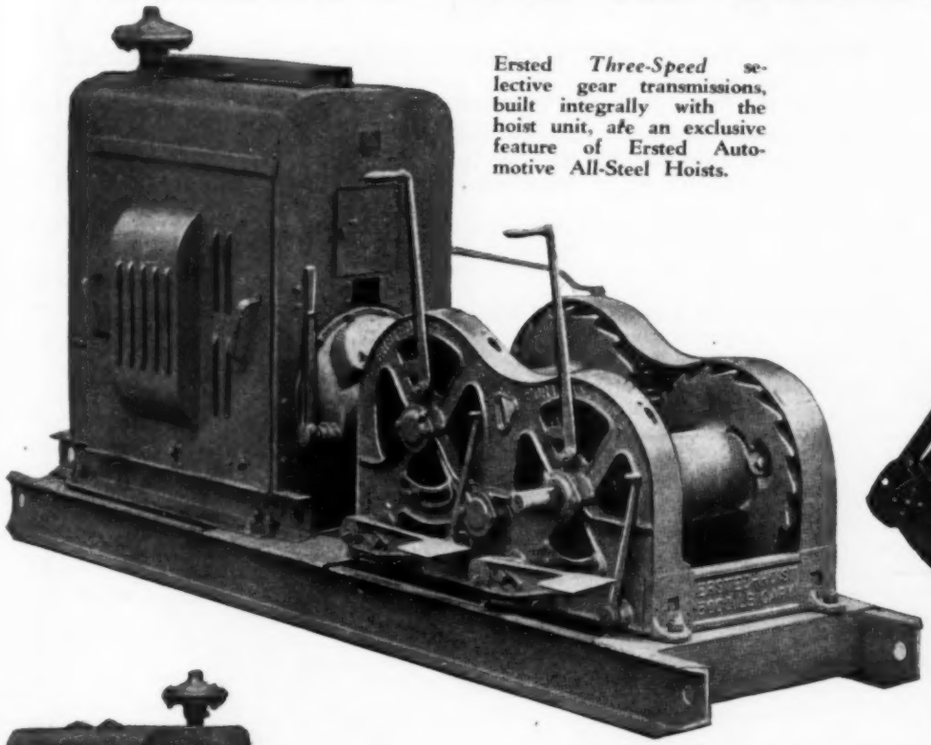
or whatever else you are looking for among these advertisements, just have in mind that these columns are open to *you,* too, and that an advertisement in the next issue will bring your wants to the attention of over 30,000 other men in construction and contracting work.

All inquiries answered promptly.

Address

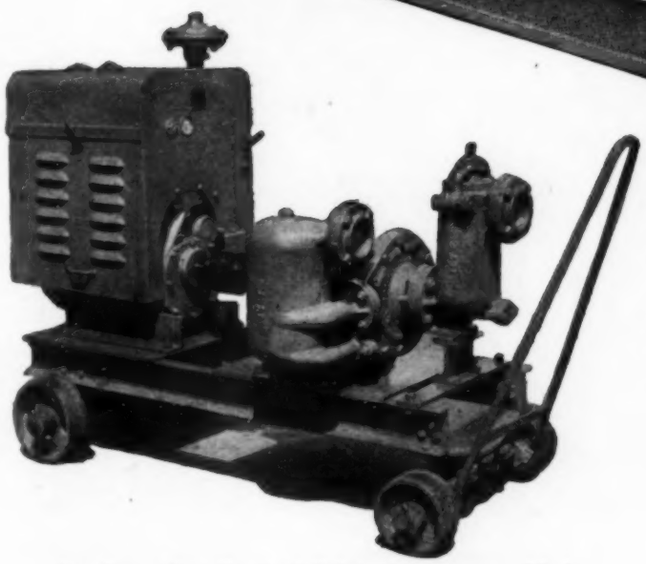
SEARCHLIGHT DEPT.
Tenth Ave. at 36th St., New York City

FOR SALE OR RENT



Ersted *Three-Speed* selective gear transmissions, built integrally with the hoist unit, are an exclusive feature of Ersted Automotive All-Steel Hoists.

"Brownhoist" Buckets. Types and sizes to fit every handling need. Rugged, Powerful. You know what the name means.



La Bour Centrifugal *Self-Priming* Pumps. Moderate Speed, Large Clearance, No Valves, Permanent or Portable. Gasoline or Electric.

"Headquarters" for Good Equipment

Not the least part of our business is co-operation with contractors—"service" that means supplying the equipment and seeing that it gives satisfaction.

Get in touch with us first and save time and money.

MOTT & McELRATH ENGINEERING CORP.

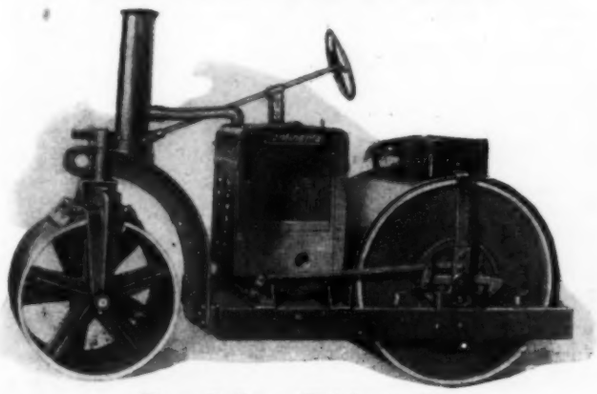
249 WEST 18th STREET, NEW YORK CITY

Phone Watkins 8588-8589-8590

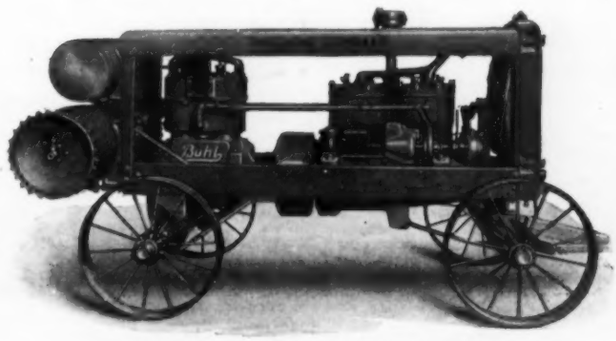
Branch Office:

MACHINERY EXHIBITS & SALES DEPARTMENT

Bourse Building, Philadelphia, Pa.



Pierce Rollers. Weight can be varied from 1½ to 2 tons.



Buhl Air Compressors. Sizes to suit all requirements.

Who's Getting the Big Contracts?

A Monthly Guide to Where the Construction Dollar is Being Spent

ON THIS PAGE *Construction Methods* lists some of the high-spot jobs for which important contracts have recently been let.

If you are looking for equipment prospects or for an employment opening in new territory, the information on this page may be of help in indicating where construction is active.

The contracts listed are, of course, only a few of the total number recently let. You may wish to ask about others. If so, address your inquiries to:

Searchlight Dept., *Construction Methods*, Tenth Ave. at 36th St., New York

Far West

Nyssa, Ore.
Dam: $3,198,779
General Constr. Co., 552 Coleman Bldg., Seattle, Wash.

Namorf, Ore.
Dam: $443,421
Derbon Constr. Co., Seattle, Wash.

Oakland, Calif.
Apartment: $300,000
T. J. Keenan, 386 Fifteenth St.

Los Angeles, Calif.
Apartment: $300,000
Olerich, 4414 W. Second St.

Glendale, Calif.
Office: $260,000
J. T. Bibb, 214 N. Brand Blvd.

Everett, Wash.
Store: $250,000
A. D. Belanger, Everett.

Ventura, Calif.
Street improvement: $793,748
Griffith Co., Railway Bldg., Los Angeles.

Los Angeles, Calif.
Boulevard improvement: $746,270
G. H. Oswald, 366 E. 58th St. Los Angeles.

Los Angeles, Calif.
Bank: $800,000
P. J. Walker Co., Garland Bldg.

Los Angeles, Calif.
Apartment: $1,000,000
Union Pacific Securities Co., 2504 W. 7th St., day labor and segregated contracts.

California
Paving State Highway: $705,950
John O. Bressi, 724 So. Spring St., Los Angeles, and others.

Seattle, Wash.
Elevators: $200,000
Kaestner & Hecht, 1500 No. Branch St., Chicago.

Moraga, Calif.
Auditorium: $1,000,000
J. P. Brennan, 2233 California St., Berkeley.

Watsonville, Calif.
Cold storage plant: $200,000
Gay Eng. Co., 2650 Santa Fe Ave., Los Angeles.

San Francisco, Calif.
Warehouse: $200,000
Barrett & Hilp, 918 Harrison St.

West of Mississippi

Galveston, Tex.
Dredging: $332,826
Orleans Dredging Co., Maison Blanche Bldg., New Orleans, La.

Point Isabel, Tex.
Hotel: $250,000
Puget Sound Bridge & Dredging Co., Puget, Wash.

Dallas, Tex.
Department store: $1,000,000
Watson Co., 1927 So. Akard St.

Rogers, Ark.
Hotel: $200,000
G. F. Hentschel, Springfield, Mo.

Omaha, Neb.
Office: $1,000,000
John Lof & Sons, 4012 Lake St., Omaha.

Minneapolis, Minn.
Y. W. C. A.: $600,000
H. N. Leighton Co., 127 So. 10th St.

Faribault, Minn.
Hotel: $250,000
Lundorff, Bicknell Co., 180 No. Michigan Ave., Chicago.

Denver, Colo.
Street improvement: $217,720
W. F. Pigg & Son, Commonwealth Bldg., and others.

Topeka, Kan.
Sewage disposal plant: $281,859
Carrothers Constr. Co., 6803 E. 39th St., Kansas City, Mo.

St. Louis, Mo.
Fruit exchange: $850,000
Boaz-Kiel Constr. Co., Ambassador Theatre Bldg.

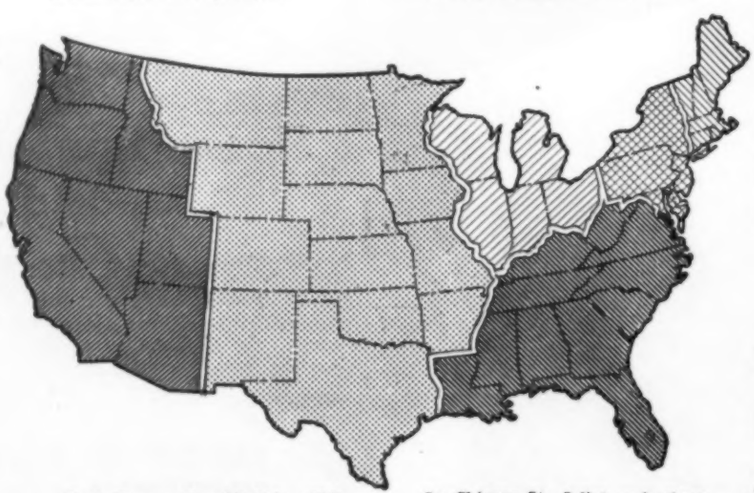
St. Louis, Mo.
Express office: $850,000
Dwight P. Robinson & Co., Inc., 125 E. 46th St., New York, N. Y.

St. Louis, Mo.
Apartment: $1,900,000
J. W. Kopman Constr. Co., 4525 Lindell Blvd.

Oklahoma
Transmission line: $202,770
C. L. Berger, Braniff Bldg., Oklahoma, City.

St. Louis, Mo.
School: $250,000
Dickie Constr. Co., Louderman Bldg.

Columbia, Mo.
Church: $425,000
J. Epple Constr. Co., Fayette and Ferguson Sts.



Middle West

Columbus, O.
Dormitory: $250,000
C. Lang & Co., 555 S. 5th St.

Evansville, Ind.
Factory: $500,000
M. J. Hoffman Constr. Co., 403 Furn Bldg.

Chicago, Ill.
Motor Salesrooms: $300,000
Holton, Seeley & Co., 140 So. Dearborn St.

Chicago, Ill.
Apartment Hotel: $350,000
Wohl Constr. Co., 3310 Belmont Ave.

Indianapolis, Ind.
Warehouse: $300,000
W. P. Jungclaus, 825 Massachusetts Ave.

Cleveland, O.
Food terminal: $450,000
Craig-Curtis Co., 4614 Prospect Ave.

Chicago, Ill.
Paving: $524,933
J. P. O'Keefe Co., 7854 So. Ashland Ave., and others.

Illinois
Paving State Highways: $2,098,574
F. C. Fentz Co., Rochester, Ind., and others.

Illinois
Highway bridges: $1,036,901
Powers-Thompson Constr. Co., 221 So. Chicago St., Joliet, and others.

Cleveland, O.
Hospital: $294,970
J. H. Wiese Co., Omaha, Neb.

Saginaw, Mich.
Office: $2,000,000
Everett Winters Co., 1651 East Grand Blvd., Detroit.

Detroit, Mich.
Sub-station: $400,000
Detroit Edison Co., 2000 Second Blvd., day labor.

Chicago, Ill.
Apartment: $500,000
E. Edlund, 6700 Crandon Ave.

Indianapolis, Ind.
Apartment: $500,000
E. W. Houser, 605 Merchants Bank Bldg.

Cleveland, O.
Paving streets: $267,216
Highway Constr. Co., Guarantee Title Bldg., and others.

New England

Durham, N. H.
Chemistry building: $273,227
S. Belanger & Son, Inc., 308 Main St., Nashua.

Hartford, Conn.
Store: $500,000
G. Cudemo and Southern New England Constr. Co., Inc., 68 Temple St.

Watertown, Mass.
Bank: $150,000
W. H. Iliffe, 93 No. Beacon St.

North Attleboro, Mass.
Theatre: $150,000
A. Piotti Co., 706 Dudley St., Dorchester.

Lowell, Mass.
Hospital buildings: $350,000
J. W. Bishop Co., 109 Foster St., Worcester.

Hingham, Mass.
Theatre: $150,000
Krokyn & Broung, archts., separate contracts.

Fall River, Mass.
Theatre: $200,000
Olympia Constr. Co., 333 Washington St., Boston.

Brookline, Mass.
Apartment: $350,000
Carlin Bros., 11 Beacon St., Boston, separate contracts.

Braintree, Mass.
Hospital: $150,000
Frankini Bros., 130 Mystic Ave., Medford.

Boston, Mass.
Store: $150,000
E. R. Boyle, 264 Beacon St.

Massachusetts
Paving state highway: $513,591
W. T. Duffee, Haverhill, and others.

Massachusetts
Paving state highway: $462,897
Arnte Bros., 499 So. Main St., New Britain, Conn., and others.

West Hartford, Conn.
School: $225,000
R. G. Bent & Co., 93 Edwards St., Hartford.

Fall River, Mass.
High school: $939,000
Greany & Sherry, 827 Davol St.

Boston, Mass.
Apartment: $160,000
R. Brien, 90 Rossmore Rd., Jamaica Plain, separate contracts.

Middle Atlantic

Washington, D. C.
Church and parish: $1,000,000
Boyle-Robertson, Inc., Evans Bldg.

Garden City, N. Y.
College; $1,500,000
Amsterdam Building Co., 441 Lexington Ave., N. Y. C.

Olean, N. Y.
Factory: $300,000
A. A. Lane Constr. Co., 1869 E. 50th St., Cleveland, O.

Pittsburgh, Pa.
Warehouse: $296,000
Carnegie Steel Co., owner-builder.

Philadelphia, Pa.
Warehouse: $400,000
Robbins Constr. Co., 1139 No. Front St.

Morsemere, N. J.
Apartment: $300,000
Rigbert Realty Co., No. Broad Ave.; separate contracts.

Irvington, N. J.
Apartment: $300,000
N. S. Kapnek, 26 Wolcott Terrace, Newark; separate contracts.

New York, N. Y.
Loft: $1,000,000
B. B. Davis Co., New York, N. Y.; separate contracts.

New York, N. Y.
Apartment, $1,000,000,
Southern Gardens, Inc., 344 E. 149th St.; separate contracts.

Brooklyn, N. Y.
Theatre: $750,000
Thompson-Starrett, 250 Park Ave., New York, N. Y.

Philadelphia, Pa.
Street Paving: $450,442
Union Paving Co., 123 So. 21st St., and others.

Pennsylvania
Paving State Highways: $1,150,224
J. C. Devine Co., Meadville, and others.

INDEX TO ADVERTISERS

	Page
Acme Rd. Mchry. Co.	66
American Cement Mch. Co.	78
Amer. Steam Pump Co.	82
Anti-Hydro Waterproofing Co.	70
Atlas Portland Cement Co.	79
Austin Western Road Mchry. Co.,	Insert 49-50
Baker Mfg. Co.	64
Barber-Greene Co.	66
Barnes Mfg. Co.	64
Bates Valve Bag Corp.	71
Bay City Dredge Works	76
Blaw-Knox Co.	53
Brooks Co., B. E.	44
Browning Crane Co.	44
Bucyrus-Erie Company	35
Buffalo-Springfield Roller Co.	66
Buffalo Steam Pump Co.	63
Buhl Company	64
Carey Co., Philip	58
Carter Co., Ralph B.	89
Caterpillar Tractor Co.	55
Cleveland Rock Drill Co.	84
Cleveland Tractor Co.	75
Clyde Iron Works Sales Co.	52
Construction Machinery Co.	78
Continental Motors Corp.	3rd Cover
Dietz Co., R. E.	45
Domestic Engine & Pump Co.	73
Eisemann Magneto Corp.	69
Ersted Mfg. Co.	81
Fate-Root-Heath Co.	4th Cover
Foote Company	57
Foundation Co.	51
Fundom Hoist & Shovel Co.	74
General Electric Co.	90
General Wheelbarrow Co.	47
Hayward Co.	77
Hercules Motors Corp.	54
Homelite Corporation	80
Huber Mfg. Co.	89
Hughes-Keenan Co.	64
Independent Pneumatic Tool Co.	34
Insley Mfg. Co.	48
International Cement Corp.	56
Jaeger Machine Co.	61
Koehring Co.	62
Kolesch & Company	74
Lakewood Engineering Co.	60
LeRoi Company	46
Leschen & Sons Co., A.	39
Lowell Wrench Co.	80
McGraw-Hill Book Co.	72
Milburn Co., Alex.	70
Monarch Tractor Corp.	43
Morris Machine Works	82
Northern Conveyor & Mfg. Co.	45
Northwest Engineering Co.	37
Novo Engine Co.	82
O. K. Clutch & Mchry. Co.	74
Owen Bucket Co.	59
Plymouth Locomotive Works,	4th Cover
Ransome Concrete Mchry. Co.,	40-41-65
Republic Iron Works	78
Roebling's Sons Co., John A.	67
Rogers Brothers Corp.	76
Sauerman Bros.	66
Schramm, Inc.	73
Searchlight Section	85 to 88
Starrett Co., L. S.	84
Sterling Wheelbarrow Co.	42
Sullivan Machinery Co.	38
Texas Co.	Second Cover
Thew Shovel Co.	33
Toledo Pressed Steel Co.	72
Trench & Marine Pump Co.	83
Union Carbide & Carbon Corp.	36
Universal Crane Co.	68
Universal Portland Cement Co.	2
Watson-Stillman Co.	74
Walker Cement Products, Inc.	70

HUMDINGER PUMPS

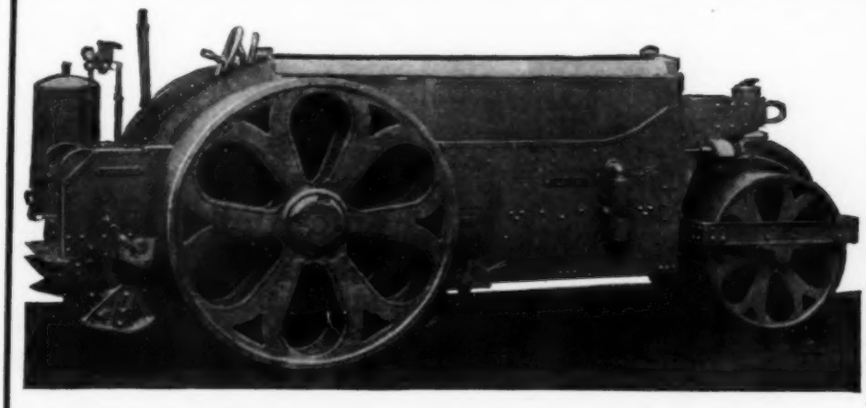
Non-clogging, everlasting rubber ball valves, totally enclosed, running-in-oil jacks, bronze bushed bearings, all steel trucks, and enclosed engine crank cases make HUMDINGER PUMPS.

THE CONTRACTOR'S CHOICE

Full detail description given in Bulletin No. 1034 CM. Send for a copy.

RALPH B. CARTER CO., 126 Chambers St., New York

Factory: Hackensack, N. J.



HUBER

4 CYLINDER

MOTOR ROLLERS

Powerful and dependable, quick in action, economical to operate. Made in 4 sizes (5-7-10-12 Tons). Send for Huber Motor Roller Catalog.

THE HUBER MFG. CO.

315 E. Center St., Marion, Ohio

For the man who borrows *your* copy of "Construction Methods"

We all know him. He doesn't mean to bother you. He really means it when he says he'll return your copy.

But you know that, for some reason or other, he seldom does.

Give this man the coupon - - - ,

Tell him for $1, he can get his *own* copy each month for the next two years.

Construction Methods, Tenth Ave. at 36th St., New York, N. Y.

ENCLOSED FIND ONE DOLLAR
ENTER MY 2-YEAR SUBSCRIPTION TO CONSTRUCTION METHODS

Name .....

Address .....

City ..... State .....

Company Employed by or Business Connection....

.....

Nature of Business..... Title .....

Contractors Prefer Electric Equipment

These reasons were given by representative contractors, queried in a nation-wide survey:

- Economy
- Few repairs
- Low upkeep
- High salvage value
- Dependability
- Best for cold-weather work
- Breakdowns minimized
- No smoke or soot
- No handling of fuel or ashes
- Reduced fire hazard
- Convenience
- Ease of handling and operating
- Compactness
- Flexibility
- Noiseless
- No water lines.

In the operation of BRICK HOISTS

Three Lambert high-speed brick hoists were used by the Turner Construction Co., New York City, in the construction of the New Jersey Bell Telephone Building in Newark, New Jersey. They were operated by G-E Motorized Power.

The Turner Construction Co. is one of the many nationally known contractors who not only employ electricity on their projects but utilize it most effectively through G-E Motorized Power.

—and other contractors say:

"We use approximately 19 electric motors in connection with our construction work. These motors vary in size from 5 hp., which we use on light portable saw outfits and pumps, to 75 hp., for use on heavy hoists. We believe the use of electric power in this locality is a great deal more economical than that of steam or gasoline."—*Edwards, Wiley, and Dixon Co.*

Motorized Power
—fitted to every need

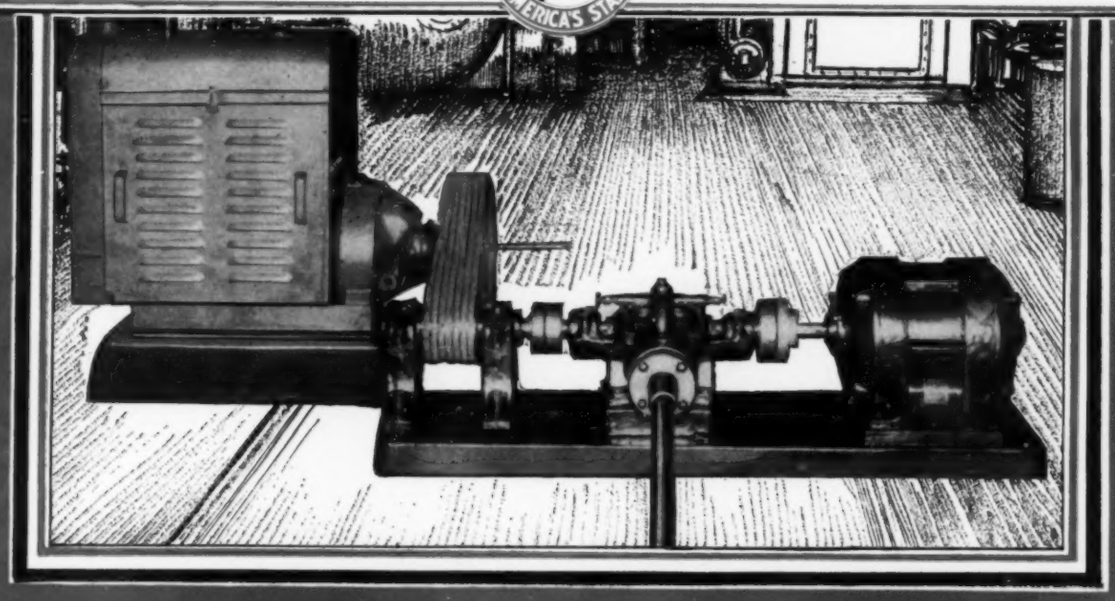
200-176

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

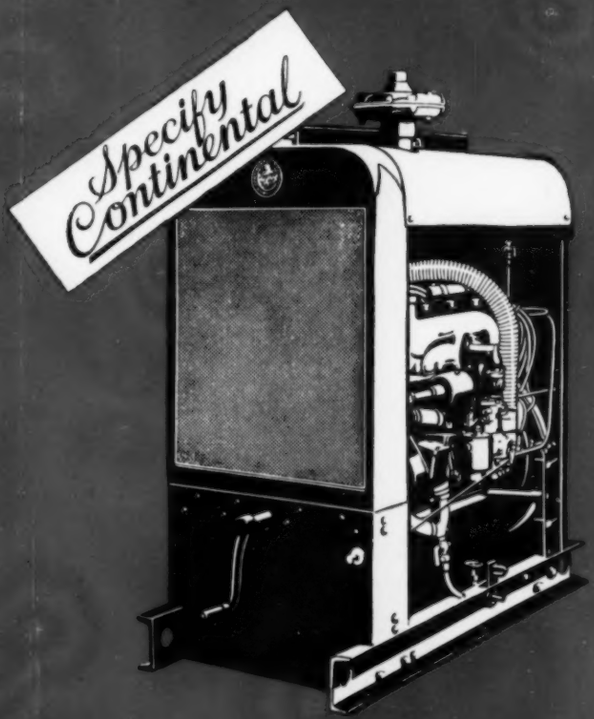
Dependable Power for Every Purpose

CONTINENTAL MOTORS — Power that's as Big as a Nation — AMERICA'S STANDARD



Economical Power for Stationary Units

Among the many uses for Continental Heavy Duty Motors the Allis Chalmers installation illustrated above is of special interest. A 2½ x 2" S. J. H. Centrifugal Pump is direct connected on one side to a 15 h. p. 3500 R. P. M. Cage Motor and Texrope driven, on the other side by a Continental Model P-20A Power Unit. This installation insures economical gasoline power through every working day.



CONTINENTAL MOTORS CORPORATION
INDUSTRIAL EQUIPMENT DIVISION
Office and Factory: Muskegon, Michigan
The Largest Exclusive Motor Manufacturer in the World

Continental Motors

PLYMOUTHS operated on practically 24 hr. schedule to their entire satisfaction.

YOUDALL CONSTRUCTION COMPANY
SAN FRANCISCO, CALIF
April 6th, 1927

The Fate-Root-Heath Co.
Plymouth, Ohio.

Gentlemen:

We are enclosing herewith a photograph showing one of our Plymouth Gasoline Geared Type 4-Ton locomotives recently purchased from you. We have two of these in use on the Sunset Tunnel, Duboce Avenue Route, for the City and County of San Francisco, California. This picture was taken in connection with the celebration of "holing thru" of the pilot drifts.

The dimensions of the Sunset Tunnel are as follows: width-25 feet; heights above rails-18.75 feet, and the total length between portals is 4,222 feet.

Our locomotives have been operated practically on a twenty-four hour schedule, and we are pleased to advise that we have found them entirely satisfactory.

Yours very truly,

YOUDALL CONSTRUCTION COMPANY

By Leon and F. Youdall

One of the Plymouths working in the tunnel.

GASOLINE PLYMOUTH LOCOMOTIVES DIESEL

When the heading of the Sunset Tunnel was broken through, the City of San Francisco held a celebration. Youdall Construction Company conceived the idea of a large parade showing the equipment being used in the tunnel. The photo shows our "float" entered by Garfield & Company our San Francisco representatives.

Helping to "hole through" for Youdall Construction Company on the Sunset Tunnel job meant knuckling down to a schedule of practically twenty-four hours a day for two of our Eight-ton Plymouths. "Get it and go and keep coming back" was the demand. And they did it just as expected.

Sunset Tunnel at San Francisco is designed for two way street car traffic serving a large area on the west side simplifying traffic to the business district and ferries. The total estimated cost not including the trackage is $1,651,983.00.

Here again time meant money and lost time would mean complications and set backs. Dependable equipment was the first requisite and again as in hundreds of other important engineering jobs you see Plymouths doing their stuff.

PLYMOUTH LOCOMOTIVE WORKS
The Fate-Root-Heath Company
299 Riggs Avenue
PLYMOUTH, OHIO

PLYMOUTH

Gasoline and Diesel Locomotives